EBC

Energy in Buildings and Communities Programme

Changing Business-as-Usual: Building Code Virtual Diagnostics & Inspections

September 15, 2020, 13:00 – 14:30 UTC

EBC Building Energy Codes Working Group Webinar

Mr. Jeremy Williams

U.S. Department of Energy

Some Administrative Notes

EBC
Energy in Buildings and Communities Programme

- We are recording this webinar so that we can make it available to EBC members in the future. Your participation indicates your consent.
- We would like everyone to mute themselves to minimize extraneous noise.
- Please put questions in comments and we will go over as many as possible during the discussion section (see the chat function at the bottom of the screen).

Webinar Overview

EBC
Energy in Buildings and Communities Programme

- Building on May BECWG webinar on Building Energy Issues and the COVID-19 Response
- Webinar Goals:
  - Explore opportunities for increasing virtual code inspections and energy audits in response to the pandemic, including the potential costs savings and additional impacts of remote inspections worldwide
  - Learn about experiences and new practices around the world in this space to address both the current situation as well as to inform post-pandemic approaches

Agenda

(*Times are in UTC)

EBC
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13:00 **Welcome and Topic Overview**
Jeremy Williams, U.S. Department of Energy

13:10 **Lessons from Australian buildings during the COVID-19 pandemic| Q&A**
Carlos Flores, NABERS (Australia)

13:30 **Welcome to the REMOTE Inspection Program "What it is and what it isn't" Pre-, During and Post-COVID-19**
Valarie Evans, City of North Las Vegas (U.S.)

13:50 **Remote Inspection: What It Is and What It Isn't (A UAE Case Study)**
Bassem Khalil, Jensen Hughes Canada (UAE)

14:10 **Open Discussion**
Moderator: Jeremy Williams, U.S. Department of Energy

14:30 **Close**

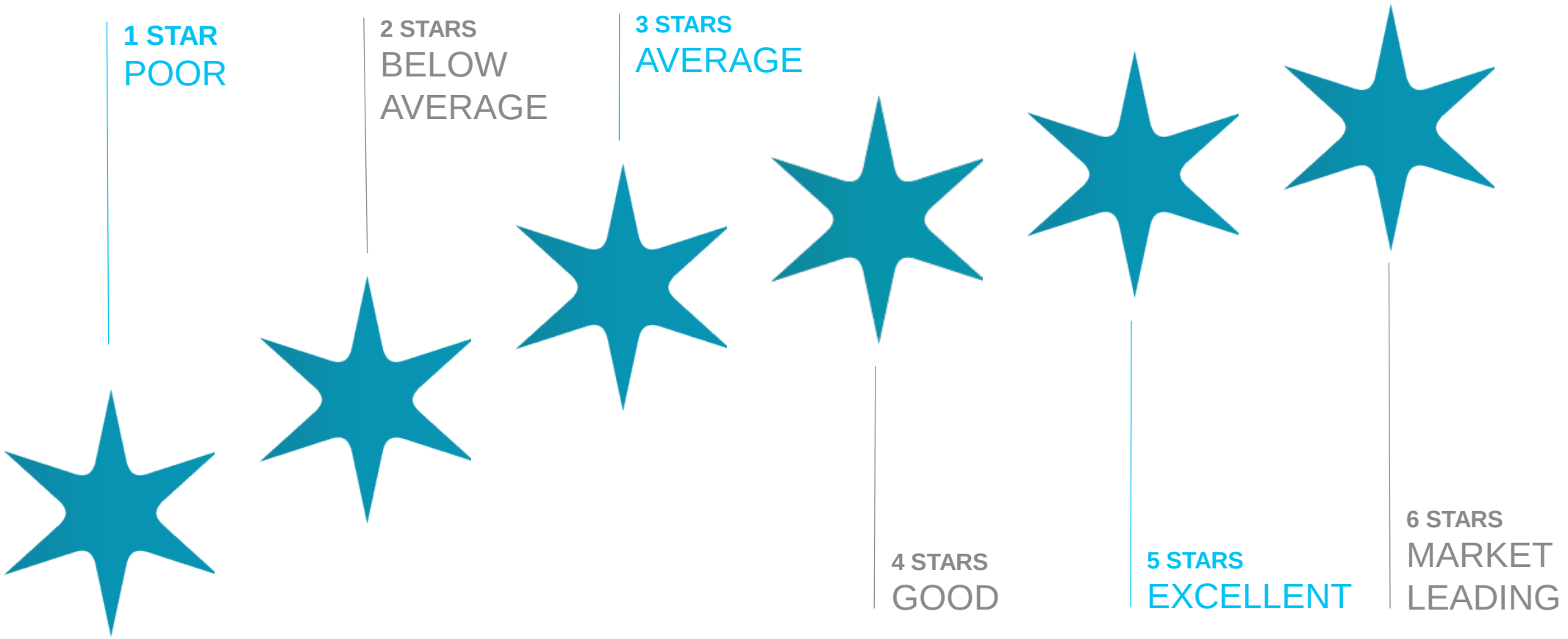
Mr. Carlos Flores

National Australian Built Environment Rating System (NABERS)

Lessons from Australian buildings during the COVID-19 pandemic

Carlos Flores | Director, NABERS

NABERS is Australia's language for building sustainability



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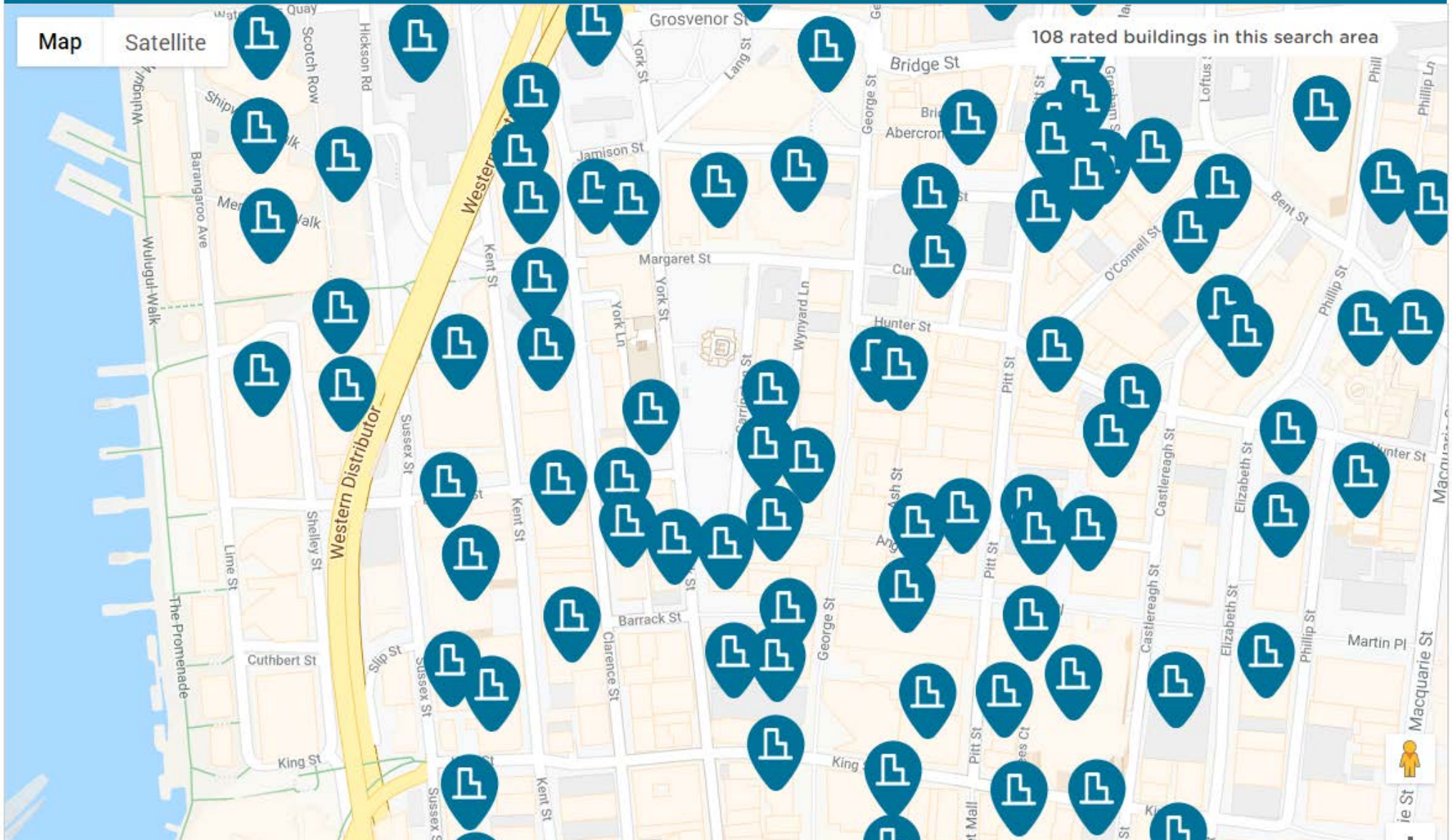
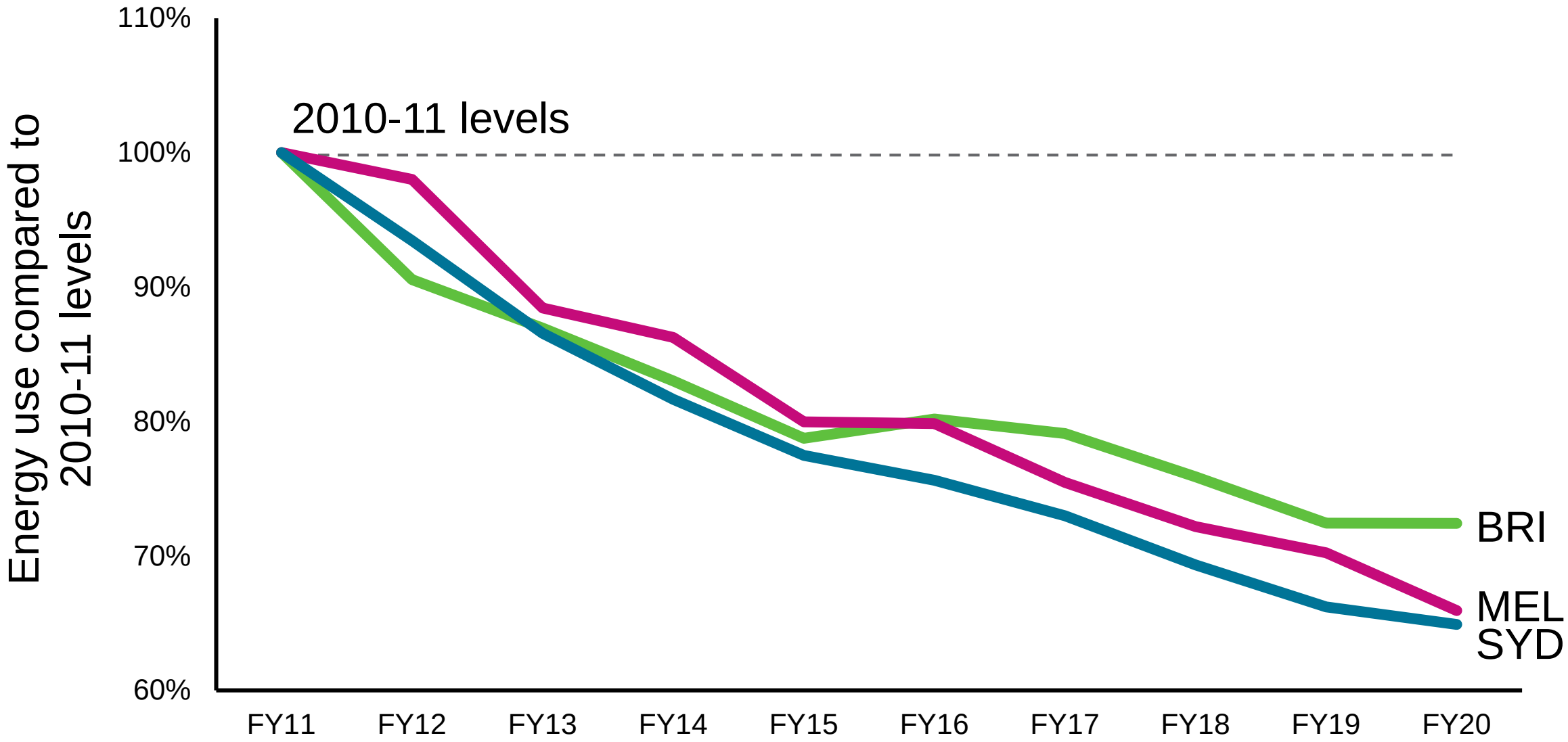


Energy use reduction in offices since July 2010



NABERS response to COVID-19 in Australia

NABERS

Our response thus far

Dedicated Taskforce to respond rapidly

Flexibility where needed (e.g. virtual audits)

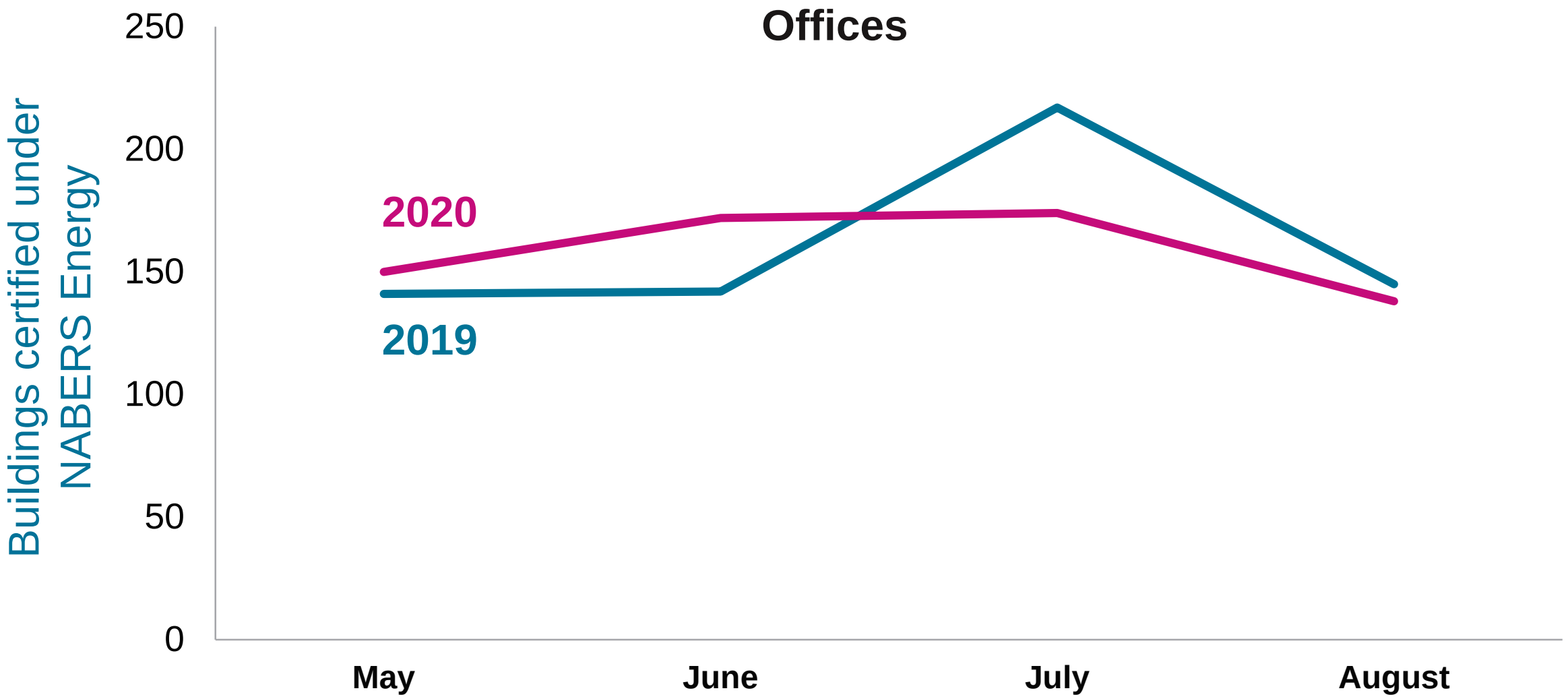
Direct line of communication with industry

Financial relief to Assessors and owners

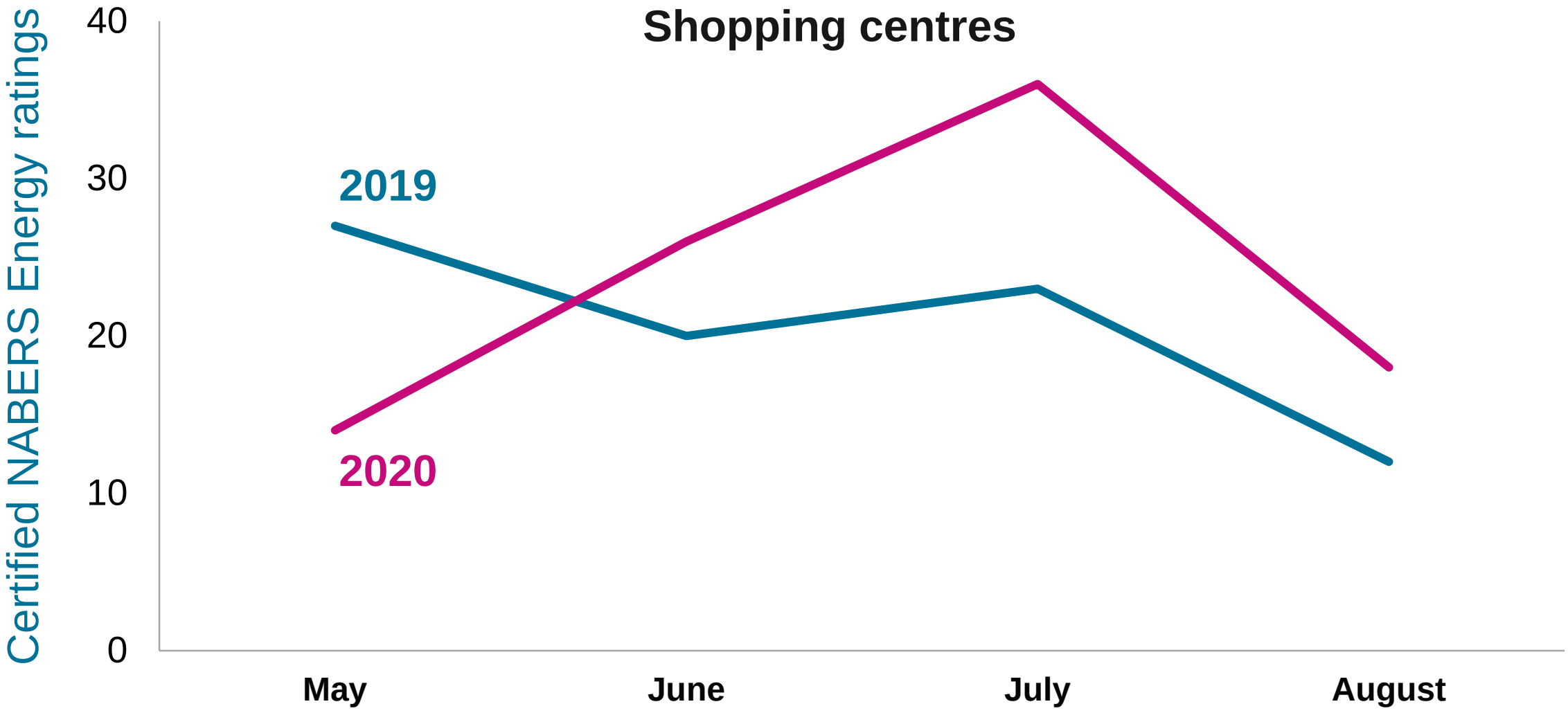
How is COVID-19 affecting energy efficiency and waste generation in commercial buildings?

NABERS

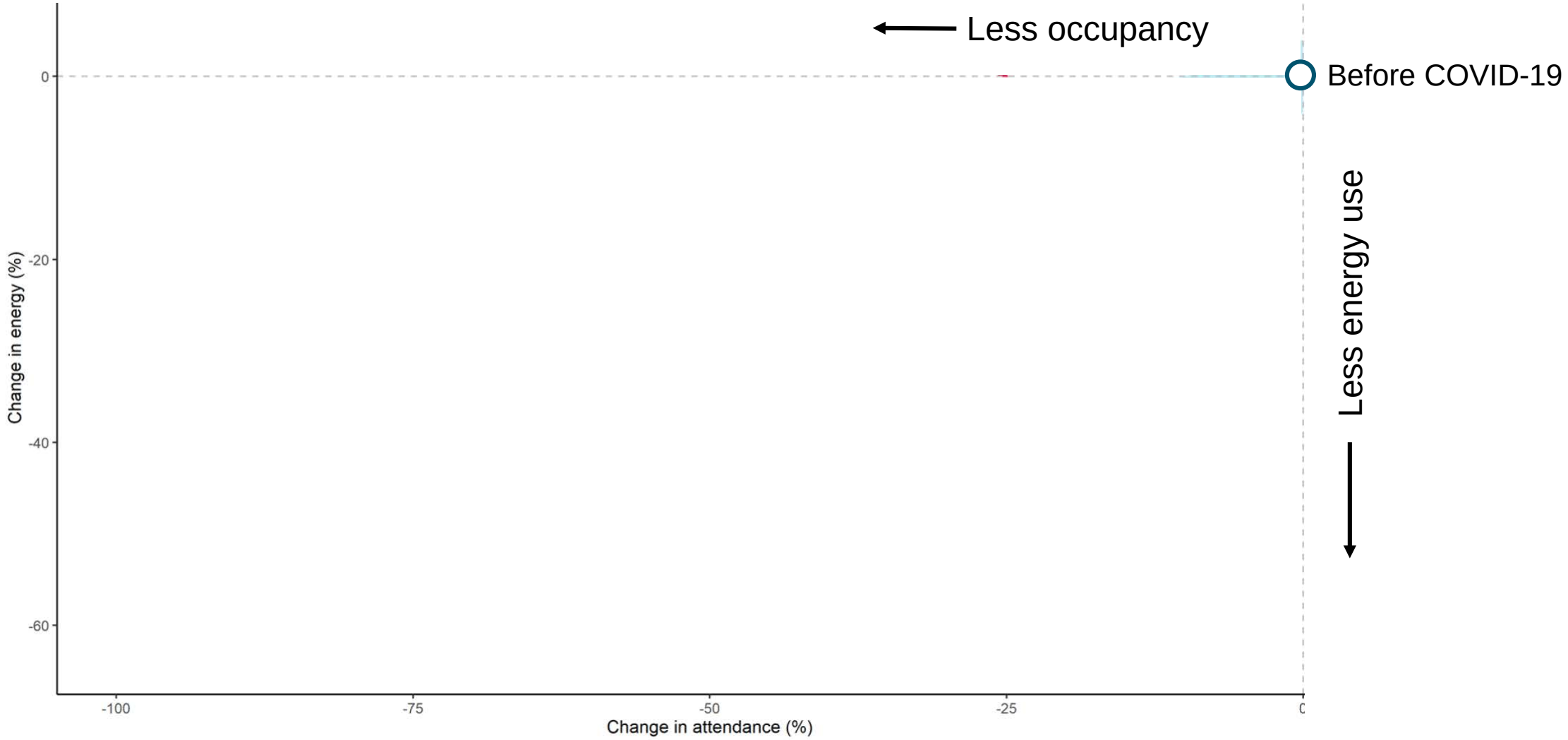
Demand for NABERS Energy ratings has been steady



Demand for NABERS Energy ratings has been steady

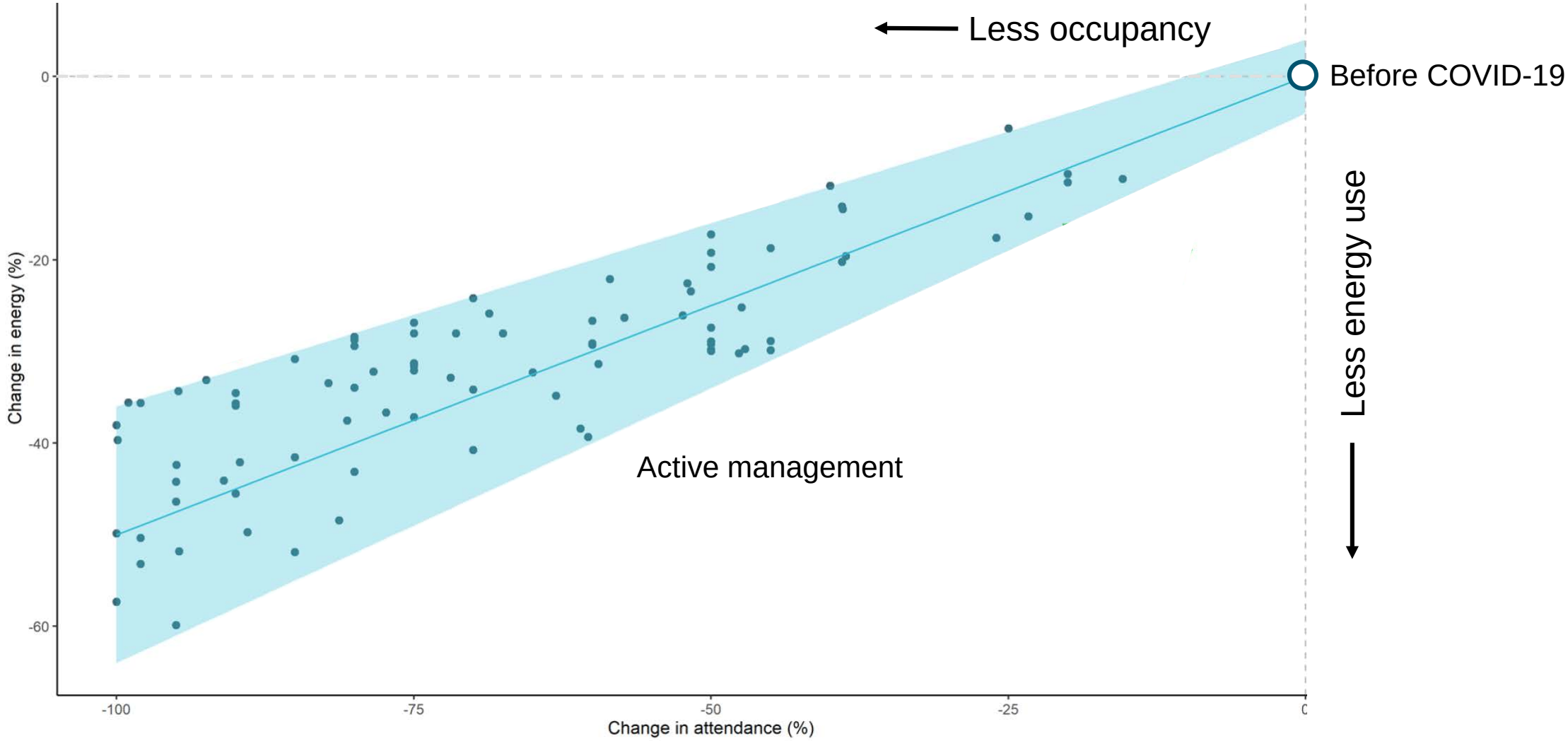


COVID-19 impact on energy use in offices



Source: Buildings Alive, available at www.buildingsalive.com/

COVID-19 impact on energy use in offices



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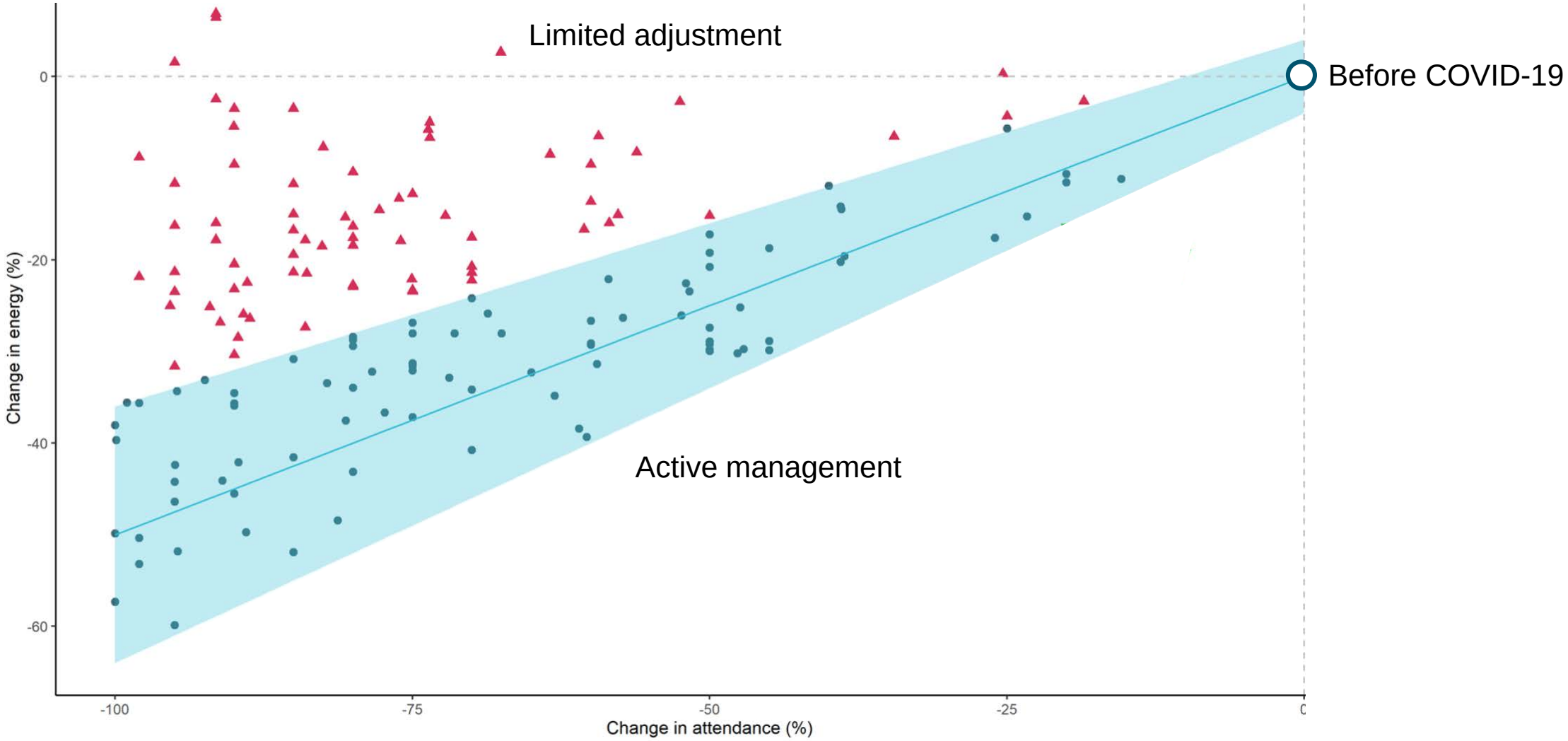
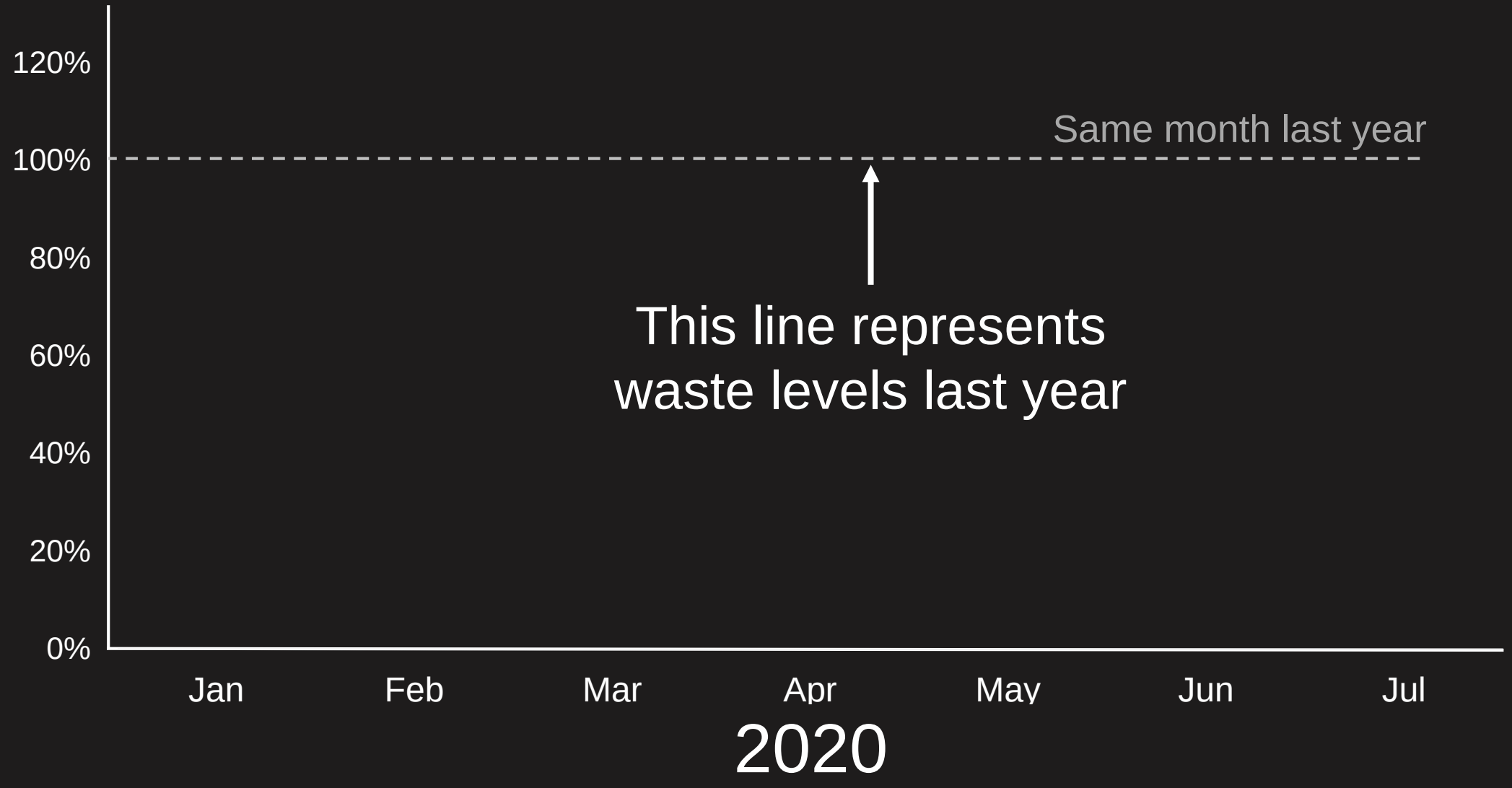


Source: Buildings Alive, available at www.buildingsalive.com/

Waste production in offices during COVID-19 pandemic



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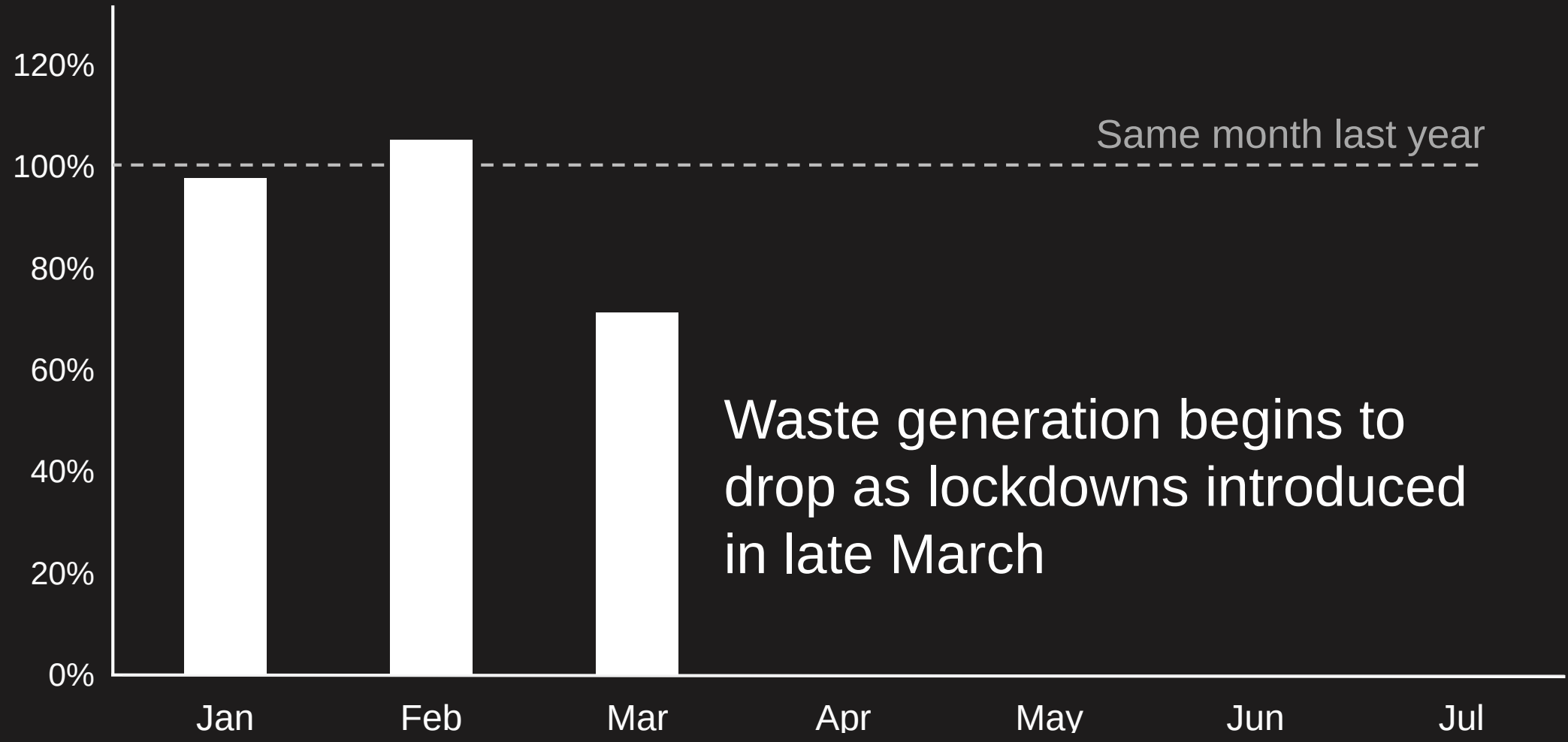

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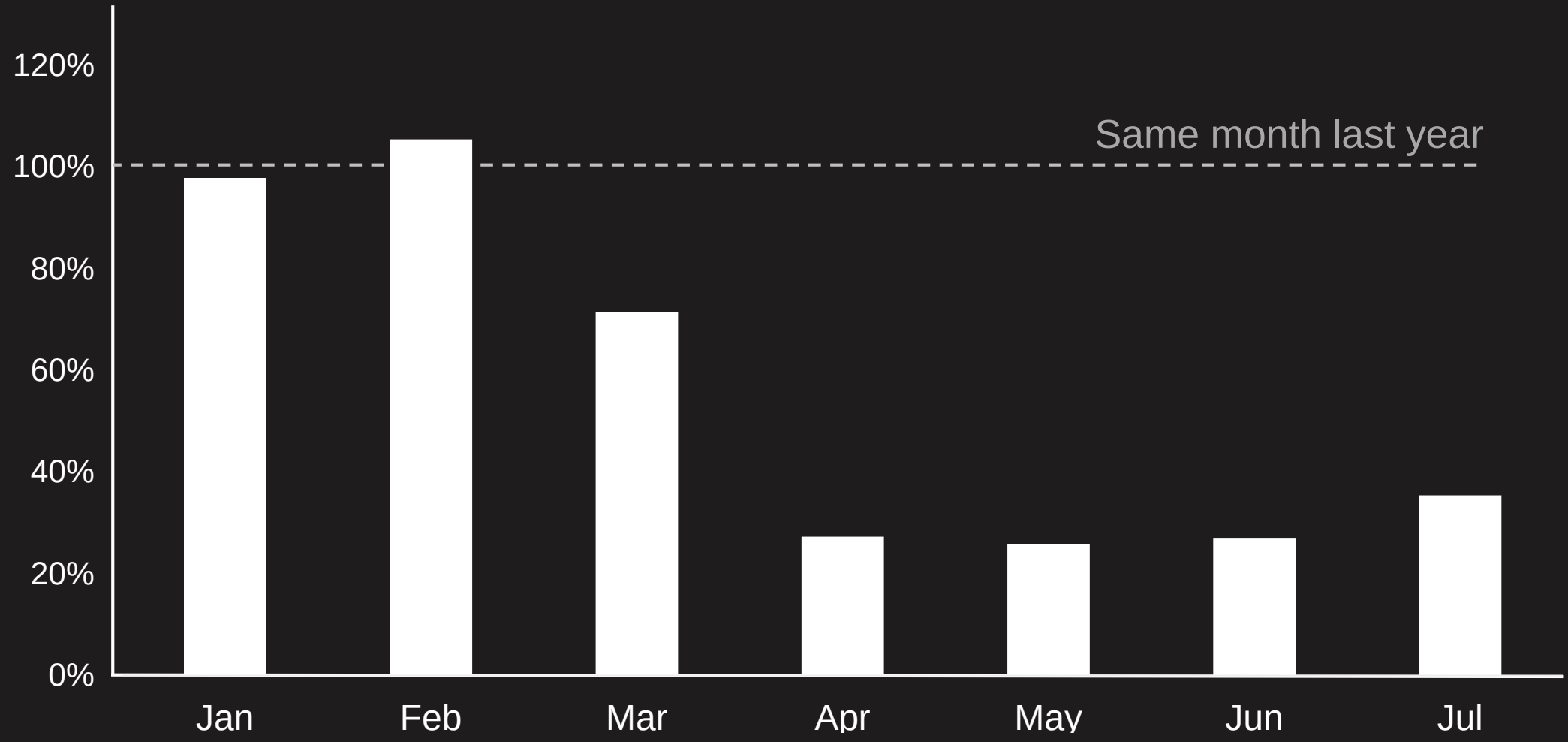

Ms. Valarie Evans

City of North Las Vegas

Welcome to the REMOTE Inspection Program “What it is and what it isn’t” Pre-, During and Post-COVID-19

Valarie Evans M.C.P

Building Official

City of North Las Vegas

CITY OF NORTH LAS VEGAS

REMOTE Inspection Program

AGENDA

- Purpose
- Setting up Virtual Inspections
- Process of Inspection
- What the Contractor Needs
- Tips, Overcoming Hurdles, Lessons Learned

CITY OF
NORTH LAS VEGAS

Pre-COVID-19: Residential Video Inspection Program

Purpose prior to COVID-19:

The purpose of the City of North Las Vegas Residential Video Inspection Program was initially intended to provide an alternative for eligible residential inspections, including limited re-inspections. The program required the customer to schedule the inspection via an Appointments Plus link on the City web page and to use the Skype app on a minimum 4G smart phone in order to interact with the City Inspector.

North Las Vegas went live with the Residential Video Inspection Program on July 1, 2019.

CITY OF
NORTH LAS VEGAS

During COVID-19: Remote Inspection Program

Purpose during COVID-19:

- The purpose of the City of North Las Vegas Remote Video Inspection is to allow the development community to have continued momentum during the Coronavirus pandemic.
- To safeguard the City employees and the public while still performing critical inspections.
- There were several families waiting to move into new homes, as well commercial timelines that were dependent on us to maintain.

Remote Inspection Program

Setting up virtual inspections:

- List of the inspections allowed to be performed remotely.
- Determine the method of media used to stream the video i.e.: Skype, FaceTime, Hangouts, Google Duo, Google Meets, Zoom, WebEx.
- How is the inspection going to be scheduled?
- How is the inspection going to be performed?
- How will you follow-up with documents? QAA, Reports, Permits.
- Archiving. Are you going to keep the video?

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Pre-COVID-19: Residential Video Inspection Program

Types of Inspections:

- Rooftop Solar
- Aluminum Patio Cover
- Water Heater
- Water Softener
- Plumbing Re-Pipe
- Gas Line Extension for BBQ and Fire Pits
- A/C Change out
- Attic FAU
- Main Line Water Repair
- Electrical Service Change
- Electric Car Chargers and Storage Systems
- Spa Circuit
- Detached Storage Sheds not to Exceed 600 Sq. Feet

Note: If for any reason the Inspector is not able to complete the inspection via the Residential Video Inspection Program, every effort will be made to route a field inspector to complete the inspection the same day. If this is not possible, the inspector will schedule a field inspection for the next business day.

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During COVID-19: Remote Inspection Program

Inspections:

- All inspections to be performed via video means.
- No in-person inspections (staff working from home).
- Photos allowed when approved by the jurisdiction, provide enough photos to allow for a complete inspection.
- Documents sent via email PDF (third party daily reports, final reports, approved revisions etc.).

CITY OF NORTH LAS VEGAS

Pre-COVID-19: Residential Video Inspection Program

- Residential scopes **greatly benefit the homeowners**, as they do not have to take off time or wait for inspections.

- Benefit to contractors to potentially only make one trip to job site.

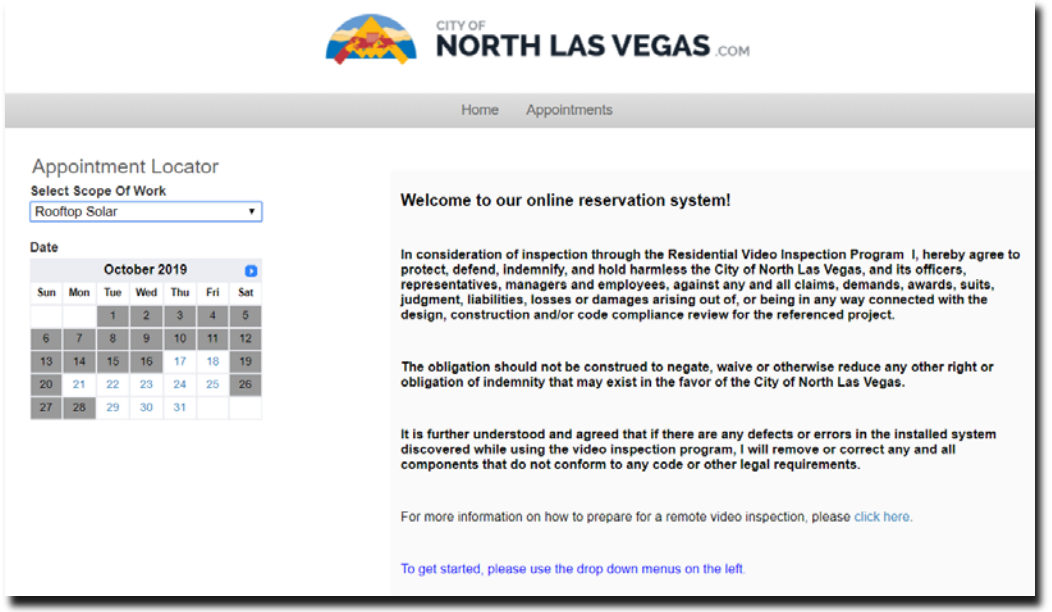
- No wasted travel time for inspectors.

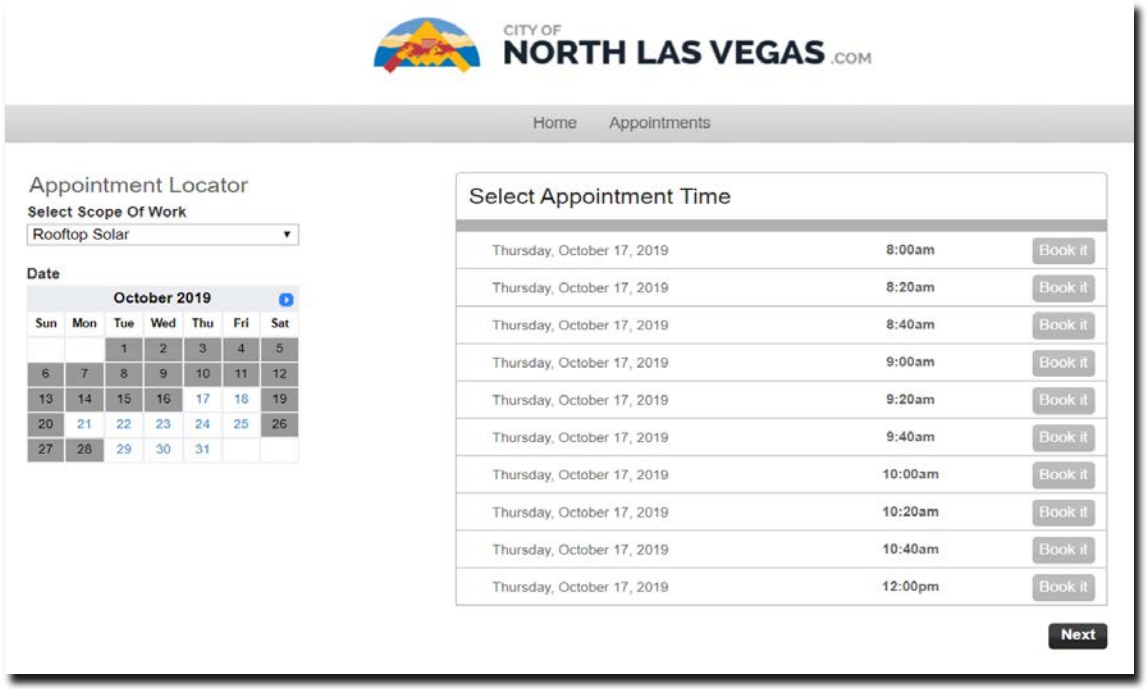
- The Current procedure requires the work to be completed first, and then the inspection is scheduled for the following day. **For this program to benefit, we must be able to perform the remote inspection after the work is complete, before covers are re-installed, ladders put away, and before the contractor leaves the site.** This may necessitate a shift in how and when inspections are scheduled. A remote inspection after the contractor leaves the site, lessens the benefit for the customers, but still has merit.

- Appointment software like **Appointments Plus** used by City of North Las Vegas.

CITY OF NORTH LAS VEGAS

Pre-COVID-19: Residential Video Inspection Program





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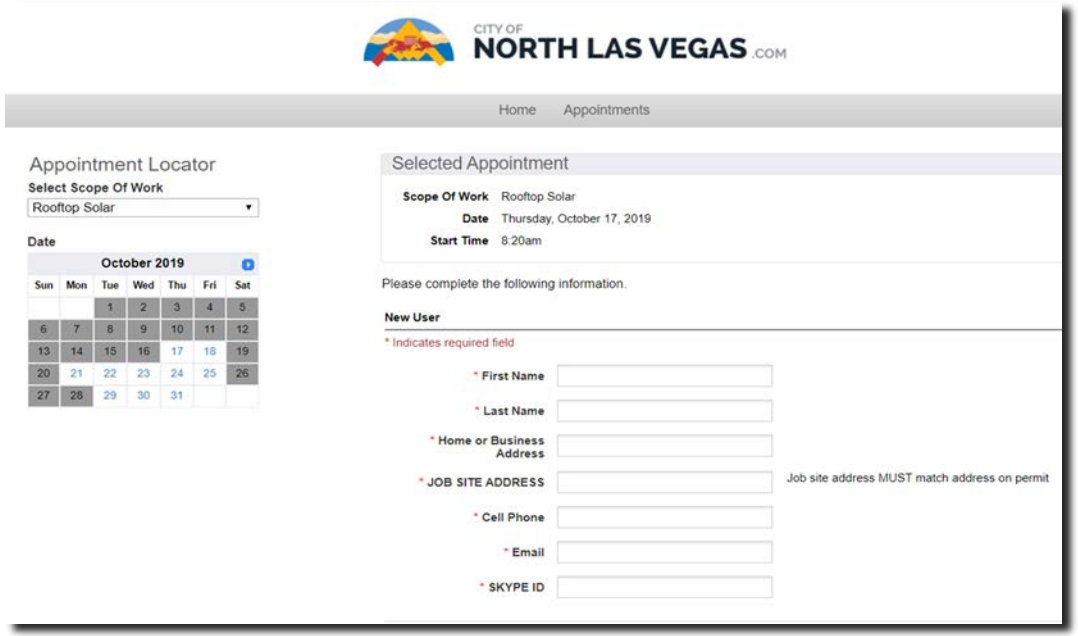
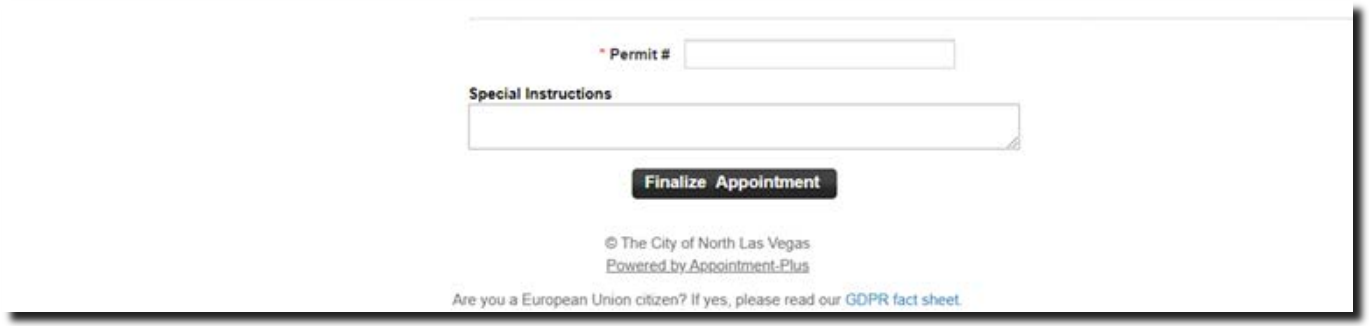
Pre-COVID-19: Residential Video Inspection Program





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Remote Inspection Program

What the contractor/customer needs:

1. 4G Wireless service -
   Ensure inspection location and smart phone or tablet has minimum 4G connectivity.

2. Media account i.e.: Skype, FaceTime, Google Duo, Google Meet, Hangouts, Zoom.

3. Prior to scheduled inspection time, ensure all necessary tools based on type of inspection are readily available. For example: tape measure, level, GFCI tester, flashlight, step ladder, etc.

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Pre-COVID-19: Residential Video Inspection Program Process

1. Prepare to receive the Skype call:

- Must be at least 18 years old or with an adult to perform the video inspection.
- Ensure smart phone or tablet is fully charged.
- Respond to Skype call from Inspector.
- Be prepared to accept video call at scheduled time.
- Have all required tools as necessary for inspection.
- Turn off notifications that may interrupt the Skype call. This is an important step, because notifications can freeze Skype and will cause delays to the inspection and a possible failed inspection.
- Use ear buds with a microphone to improve communication.
- Set phone so that you have the small screen view of what the inspector sees:
    1. Tap the Skype screen to access the tool bar.
    2. Tap the camera icon.
    3. In the small view the inspector sees, tap the reverse camera icon.

2. Start inspection:

- Begin inspection at street view looking at the structure.
- The address must be shown in the initial view.
- Follow the direction of the inspector.
- Walk inspection in a clockwise direction horizontally then bottom to top vertically (if more than one floor).
- Make notes of any corrections.

3. Inspection results:

- Inspector will inform you if the inspection receives a pass, partial or fail.
- The inspector will update the permitting system with the results at the completion of the Skype call.

CITY OF NORTH LAS VEGAS

During COVID-19: Remote Inspection Program Process

1. **Inspector gets schedule at home via VPN or other means**

   - Inspector calls each contact to schedule inspection, gives time window, and agrees on media platform.
   - Some inspectors have contractor/customer text them when they are on project site.
   - Inspector allots a minimum amount of time to perform inspection.
   - Inspector lets customer know they may be performing an inspection when their time slot occurs and will call them back when finished.
   - Inspector gets all documents electronically or via video at the time of the inspection.

2. **Start Inspection**

   - Inspector validates permit information.
   - Inspector accesses all documentation.
   - Inspector guides the inspection process.
   - Contractor/customer follows direction of the inspector.

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Post-COVID-19: Remote Inspection Program

Tips, Overcoming Hurdles, Lessons Learned

- Contact information of contractor/customer is imperative.
- Utility reconnections
- Getting Plans downloaded for projects inspectors go to regularly.
- Get contractors to think like an inspector.
- Filter all inspections to Appointments plus or another scheduling platform so the customer can choose the inspection

Changes will continue to occur AS THE PROCESS GROWS.

CITY OF NORTH LAS VEGAS

Post-COVID-19: Remote Inspection Program

When life returns to “normal”

- Identify efficiencies that were created due to Covid-19.
- Increase program guidelines to allow for more inspections via video.
  - Commercial scopes
  - Home Builders
- Identify the projects where an in-person inspection is most critical.
- Follow up on projects that may have needed a closer look.

There is no pain in change itself, there is only pain in resistance to change

CITY OF NORTH LAS VEGAS

Remote Inspection Program

Thank you

Valarie Evans M.C.P
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City of North Las Vegas
evansv@cityofnorthlasvegas.com
702-633-1580

Mr. Bassem Khalil
Jensen Hughes Consulting Canada Ltd.

JENSEN HUGHES

Advancing the Science of Safety

REMOTE INSPECTION:
What It Is and What It Isn't (A UAE CASE STUDY)

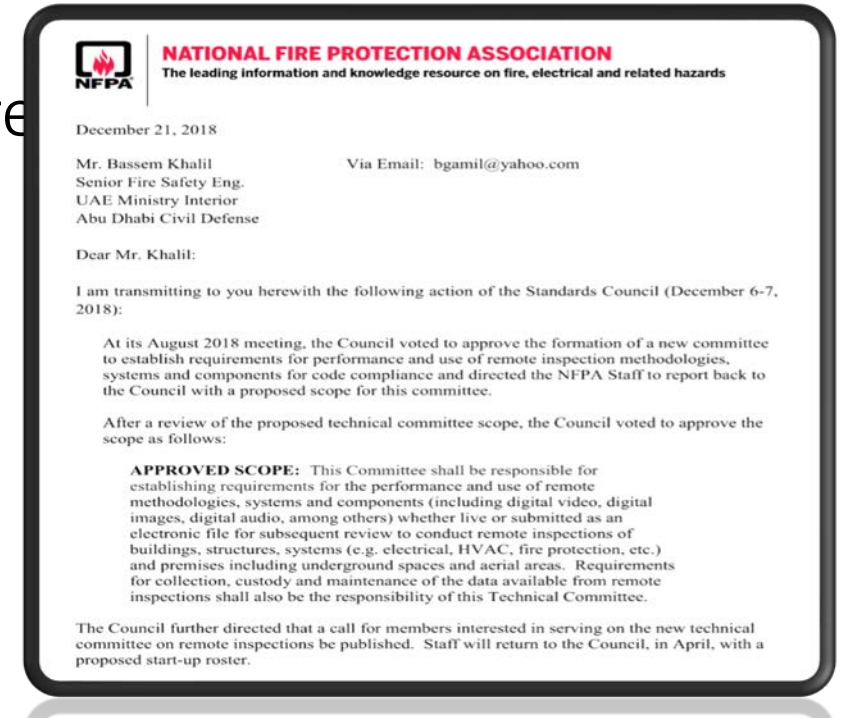
September 2020

jensenhughes.com

- Background and History
- Remote Inspection Model and Objectives
- Best Practices and Methods
- Future Developments
- UAE Case Study
- NFPA 915
- Concluding thoughts

Remote Inspection (RI) is simply an inspection communication reporting method intended to enhance inspection & testing capabilities remotely, packaged and delivered in an innovative, practical and smart way, utilizing existing project construction resources & technologies, adapting to our current and future needs; to ensure that processes, installations, policies & regulations are being performed, followed and implemented with higher quality than current inspection and reporting methods.

- In 2012, UAE witnessed a major boom in construction, where it's a major challenge keeping up with the speedy developments.
- The remote inspection idea was first implemented by UAE Ab- Dhabi Civil Defense, to hand over the iconic 1.9 billion-dollar Cleveland Clinic project.
- In 2015, the first remote inspection guidelines were the umbrella of the UAE Fire Code.
- In 2018, NFPA Standards Council Approved a proposal by UAE Civil Defense to develop a new standard, NFPA 915 for remote inspections.



NFPA

NATIONAL FIRE PROTECTION ASSOCIATION

The leading information and knowledge resource on fire, electrical and related hazards

December 21, 2018

Mr. Bassem Khalil
Senior Fire Safety Eng.
UAE Ministry Interior
Abu Dhabi Civil Defense

Via Email: bgamil@yahoo.com

Dear Mr. Khalil:

I am transmitting to you herewith the following action of the Standards Council (December 6-7, 2018):

At its August 2018 meeting, the Council voted to approve the formation of a new committee to establish requirements for performance and use of remote inspection methodologies, systems and components for code compliance and directed the NFPA Staff to report back to the Council with a proposed scope for this committee.

After a review of the proposed technical committee scope, the Council voted to approve the scope as follows:

APPROVED SCOPE: This Committee shall be responsible for establishing requirements for the performance and use of remote methodologies, systems and components (including digital video, digital images, digital audio, among others) whether live or submitted as an electronic file for subsequent review to conduct remote inspections of buildings, structures, systems (e.g. electrical, HVAC, fire protection, etc.) and premises including underground spaces and aerial areas. Requirements for collection, custody and maintenance of the data available from remote inspections shall also be the responsibility of this Technical Committee.

The Council further directed that a call for members interested in serving on the new technical committee on remote inspections be published. Staff will return to the Council, in April, with a proposed start-up roster.

1- Fire Protection Engineering

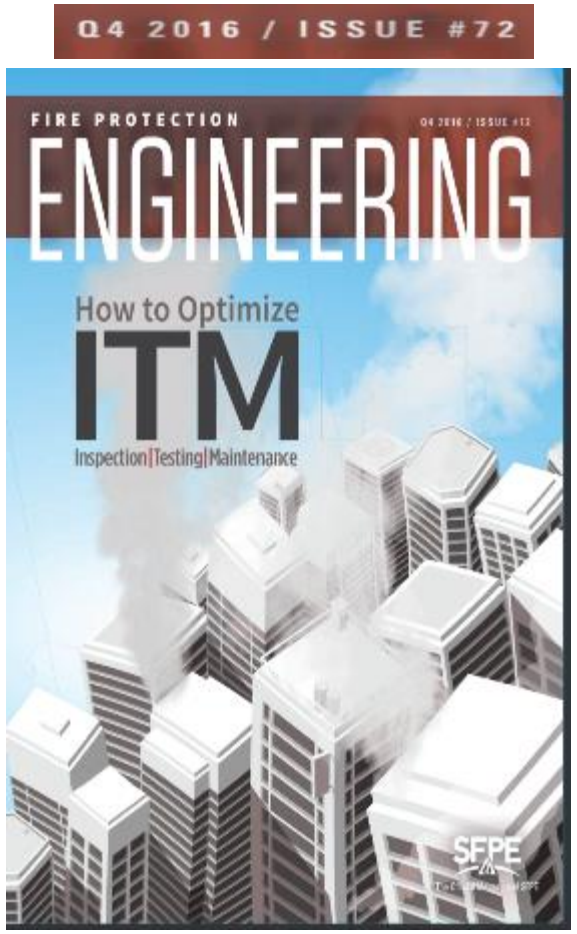
https://www.sfpe.org/page/Magazine

FPE 04 2016 ISSUE 72 (Distant Inspection Program)

42 **The Distant Inspection Program**

The future of fire and life safety system inspections and training includes commissioning and training with the latest technologies in audio-visual filming.

By Bassem Khalil



2- NFPA

https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes- and-standards/detail?code=915&tab=research

3- SFPE

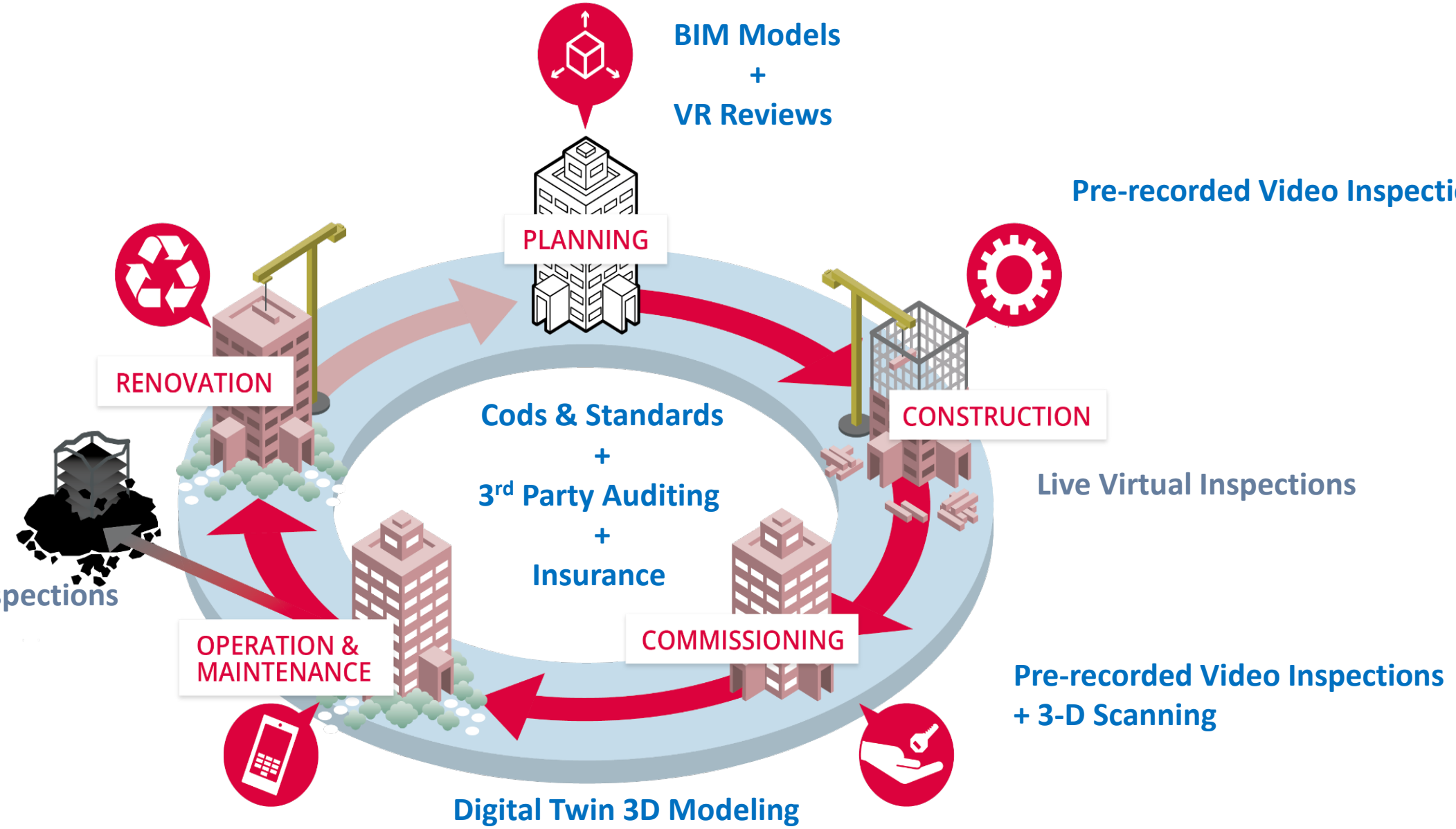
https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes- and-standards/detail?code=915&tab=research

4- ISO

https://committee.iso.org/files/live/sites/tc176/files/documents/ISO%209001%20Auditing%20Practices%20Group%20docs/Auditing%20General/APG-Remote_Audits.pdf

- Enhance inspections' quality.
- Provide quality services to end users.
- Achieve highest levels of safety.
- Develop new training tools and materials.
- Ensure knowledge transfer.
- Reduce inspection costs & save time.
- Regulate the unregulated parts of the inspection.

Provide a resilient reporting system tool for permitting, insurance companies, government officials & building owners


BIM Models
+
VR Reviews
Pre-recorded Video Inspections
Systems
Monitoring
+
I.O.T sensors
for
monitoring,
preventive
maintenance,
and accident
& damage
prediction
+
Live Virtual Inspections
+
Digital twins
PLANNING
CONSTRUCTION
RENOVATION
Cods & Standards
+
3rd Party Auditing
+
Insurance
Live Virtual Inspections
OPERATION &
MAINTENANCE
COMMISSIONING
Pre-recorded Video Inspections
+ 3-D Scanning
Digital Twin 3D Modeling

1- Live Virtual Inspections

2- Remote Pre-recorded Video Inspections

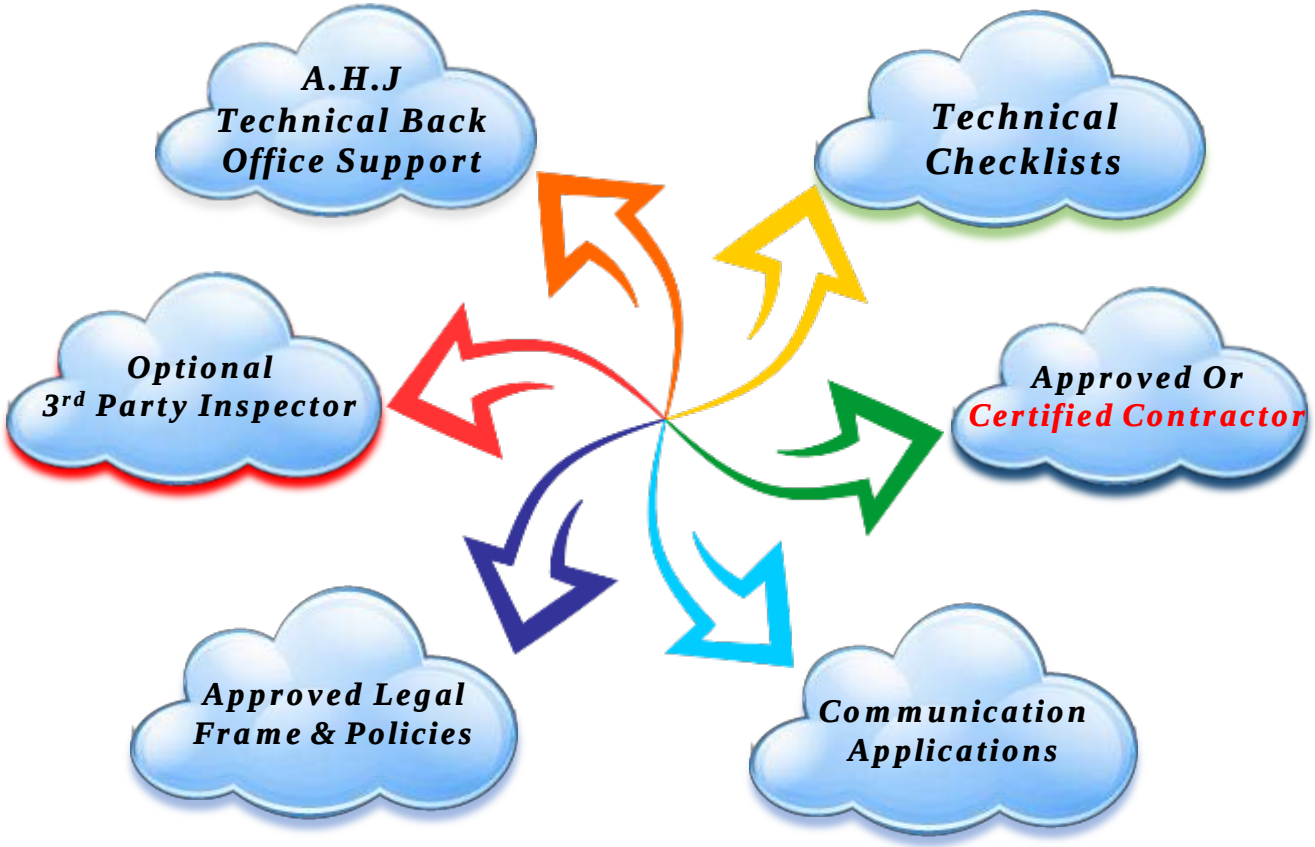
- 3D Scanning

3- Post Construction Building & Systems Monitoring

- Digital twins
- 3D modeling
- Systems monitoring
- I.O.T., monitoring, preventive maintenance, and accident & damage prediction

1- Live Virtual Inspections

Recommended Use For Periodic & Simple Re-inspections



Recommended Tools & Accessories

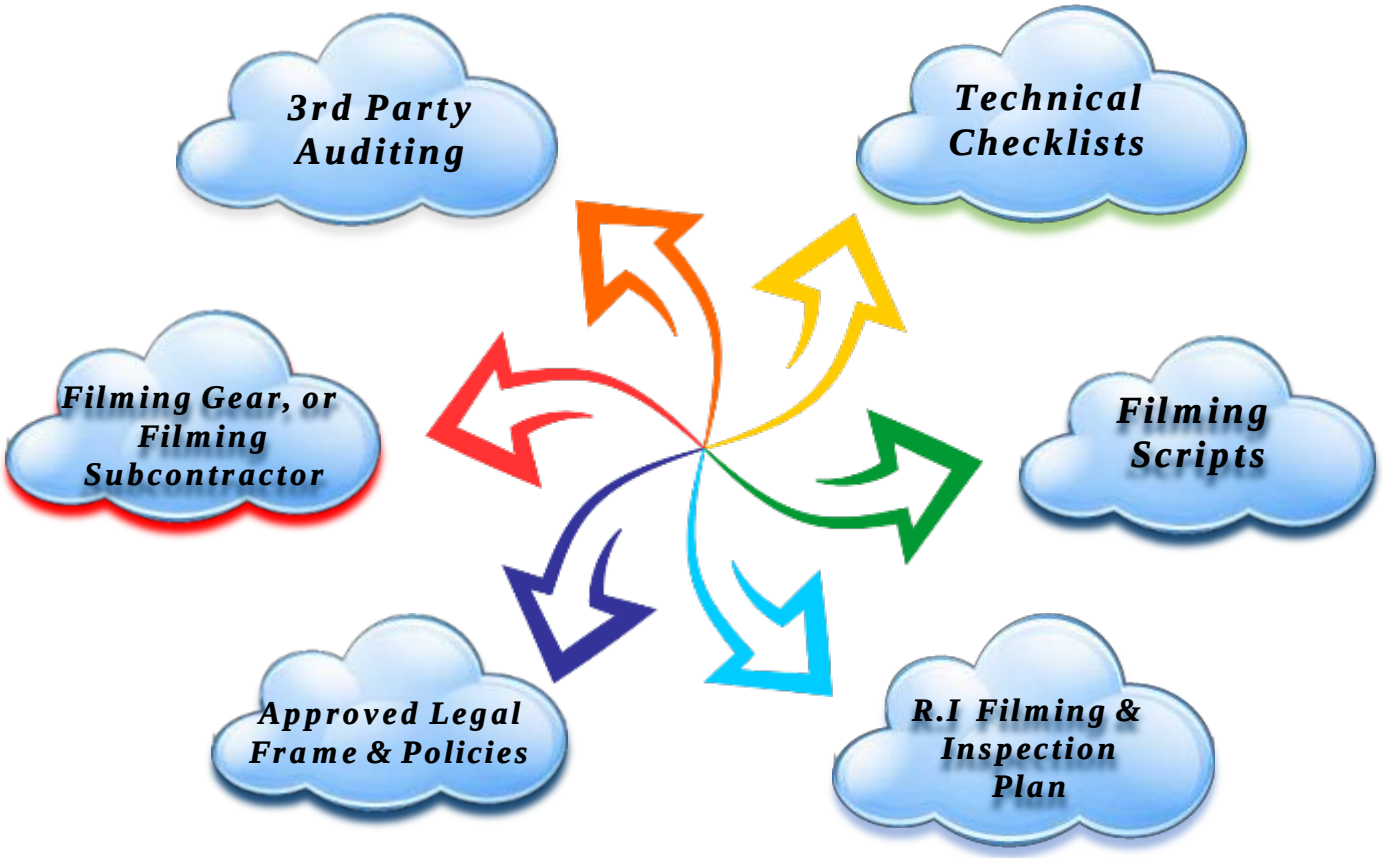
Redundant mobile phones & power banks

Tripod or stabilizing phone holder

Internet 3g or WIFI Coverage

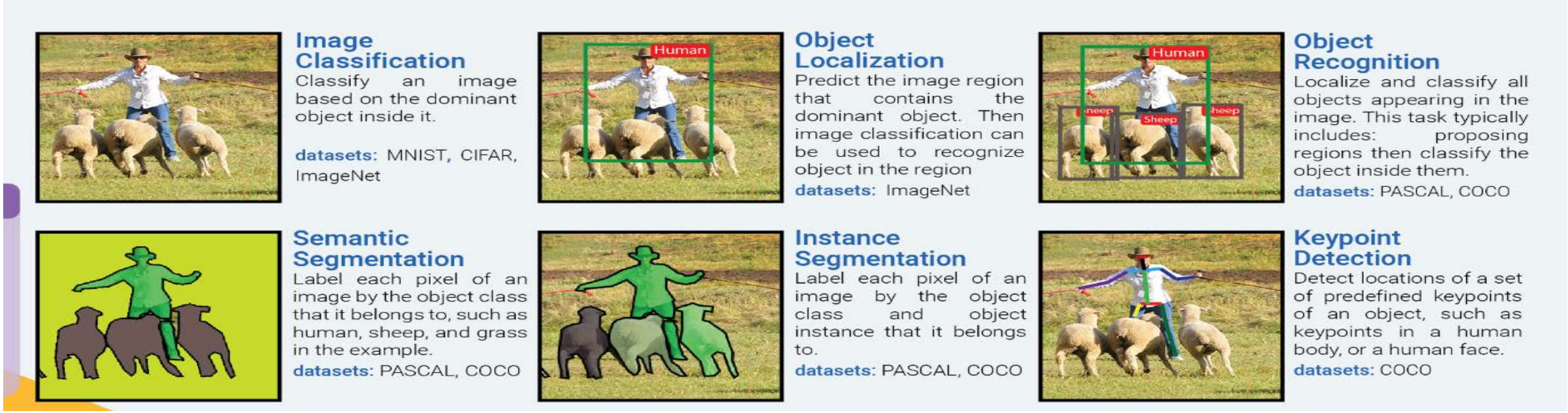
2- Remote Pre-recorded Video Inspections

Recommended Use For New Buildings



Building final testing and commissioning, where inspection videos are audited by a third-party inspection. (e.g. a high-rise inspection)

- **3-D modeling versus 3-D scanning (360)**
- **Object recognition technology**



https://en.wikipedia.org/wiki/Outline_of_object_recognition
https://my.matterport.com/show/?m=U3iYWMTh7Do
https://medium.com/@nikasa1889/the-modern-history-of-object-recognition-infographic-aea18517c318

For more than 13 years UAE Abu Dhabi Civil Defense has been conducting remote inspections.

Fire Stations
Our Department
Communities Awareness
Smart Services
Our Regulations
Safety Tips
Companies
Preventive Safety
Our Policies
Strategic Plan
Services Guidelines

16277 | Wednesday, 21 Mar 2018 11:33 Rating5.0 Vote1

- Click here to Download E-Brochure

Smart Monitoring System for Private & Public buildings :

Installation of Dubai Civil Defence 24x7 Smart Monitoring System in all public and private buildings and establishments in Dubai is a mandatory requirement laid down by law No 24 of 2012. With the system in place, Dubai Civil Defence will be able to monitor buildings in real-time for life and safety alarms. E-monitoring of this magnitude will strengthen the safety infrastructure of the city to increase safety measures. From the Souks of Old Dubai to the iconic skyscrapers, Dubai Civil Defence will be able to effectively protect the city's national wealth and the people who move in and around it. Using state of the art M2M technology, every building and asset within Dubai, both government and privately owned, will be monitored for fire, lift and emergency alarms 24x7. Under the visionary leadership of H. H. Sheikh Mohammed Bin Rashid Al Maktoum, Vice-President and Prime Minister of UAE and Ruler of Dubai, Dubai Civil Defence is a dynamic and motivated organization

- 24x7 monitoring for life and safety alarms
- Accurate & timely reporting
- Early notification of an emergency
- Coordinating emergency services including fire brigade, police and medical services
- Supplying Civil Defence with a pre-existing information database of the building containing the shortest route to the building, the number of levels, emergency entrance and exits, surrounding buildings, hazardous materials inside the building and nearest water supply point. This allows Civil Defence to choose the suitable equipment for every accident allowing them to respond more effectively
- A range of alarm signals sent via the system to Civil Defence, including fire alarm, elevator alarm, emergency alarm, safety equipment malfunction, power interruption, low water level in reservoirs, water pump malfunction and gas leakage alarm
- Regular testing of fire-fighting equipment such as fire pumps are coordinated from the control room to ensure that systems are live and active

- Three draft development meetings held; Last meeting was virtual :
  - NFPA 915 is now published for public input. www.nfpa.org/915
  - NFPA 915 Public Input to close on June 1, 2021.

- Scope and Purpose:
  - Procedures, methods, and documentation associated with remote inspections
  - Deliver an equivalent or improved result as that which would be obtained with other inspection methods
  - Process must be approved by AHJ
  - Does not apply to periodic inspections and tests

- Devices
  - Wireless
  - Digital
  - Non-digital
  - Vehicles

Data Collection

+ Written
+ Photograph
+ Video
+ Audio

Remote Inspection Is Not:

- An easier method of inspection
- New
- A monitoring system
- Yet regulated
- A complete replacement to normal inspections
- Remote

Remote Inspection Is:

- More detailed
- A higher quality process
- Better documentation
- Innovative
- A great BD tool
- A high-quality reporting system

Remote Inspections are Here to Stay

Presented by:

Bassem Khalil
bkhalil@jensenhughes.com

EBC

Energy in Buildings and Communities Programme

Discussion

Please put your questions in the chat window. Thank you!

EBC

Energy in Buildings and Communities Programme

Thank you!

https://www.iea-ebc.org/working-group/building-energy-codes