2021 INTERNATIONAL CODE COUNCIL® CONFERENCE AND HEARINGS

Advances in Technology Solutions

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ICC INTERNATIONAL CODE COUNCIL®

Emory R. Rodgers
Leadership in Building Safety Fellowship

Receive up to $20,000 to use toward an eligible executive development program.

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www.iccsafe.org/EmoryRodgersFellowship

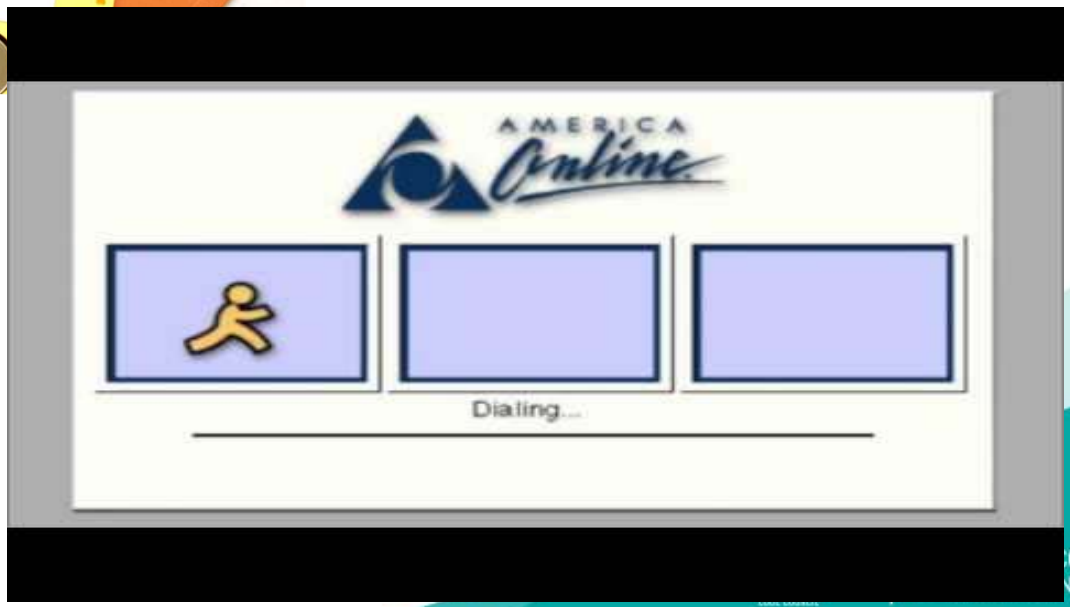
Digital Transformation

- Digital Transformation **is a journey**
- The **impact of the pandemic** on the building safety industry
- **New mindset** creates best chance for success
- What does **digital mean to the customer**
- Utilizing data analytics and product management expertise **to solve pain points for customers**
- Digital strategy **create better tools**, **24/7 access** to codes, standards and online resources and education

Digital Transformation

Digital transformation is the **process of using digital technologies to create new — or modify existing — business processes, culture, and customer experiences** to meet changing business and market requirements. ... It transcends traditional roles like sales, marketing, and customer service.

Signs of Change



Digital Evolution

Digital Transformation in the Construction Industry: BIM

- BIM: Business Information Modeling
  - Improve Onsite Collaboration and Communication.
  - Model-Based Cost Estimation.
  - Visualize Projects in Preconstruction.
  - Better Coordination and Clash Detection.
  - Mitigate Risk and Reduce Cost.
  - Improved Scheduling/Sequencing.
  - Increase Productivity with Prefabrication.

Remote Teams

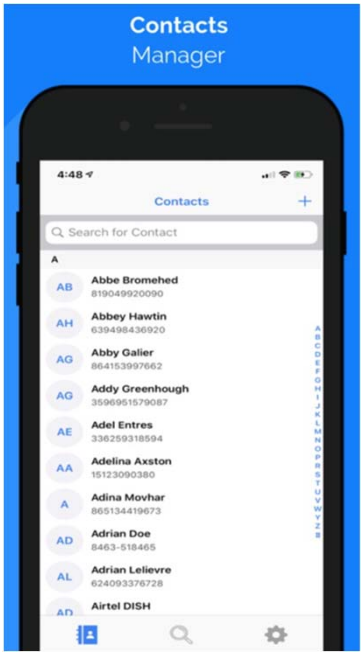
- Being remote changes the way that people work, so we need to change the tools used to perform the work

Why Digital?

- Meetings
  - In Person -> Zoom / MS Teams
- Notes
  - Notepads -> iPads and Tablets
- Calls
  - Audio -> Video / Facetime
- Collaboration
  - Flat Files -> Cloud accessible real time edits

Evolution of Technology

Digital Transformation

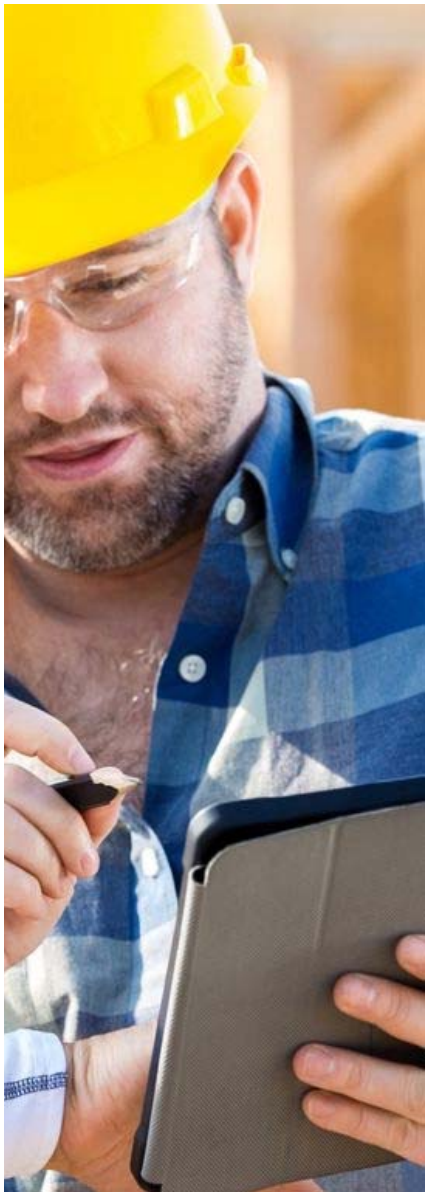


Group Discussion

- Pain points in current environment conditions
  - How has the pandemic impacted your team communication?
  - How has your daily workflow changed?
  - What tools have you started using as a result of working with remote teams?
  - Has your means of accessing the codes and standards content changed?
  - Are you using online services within your jurisdiction?

Why ICC is Embracing Digital

- Efficiencies of technology
- Speed to market
- Standardization of Content
- Tagging of supplemental content
  - Code Interpretations
  - Significant Changes
  - Multimedia Content
- Integration opportunities



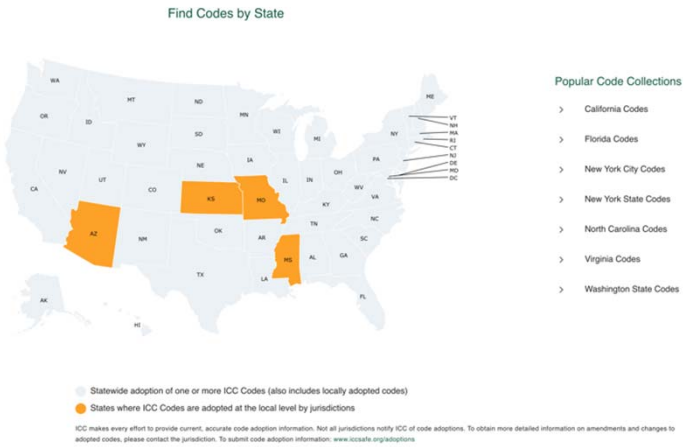
San Diego Case Study

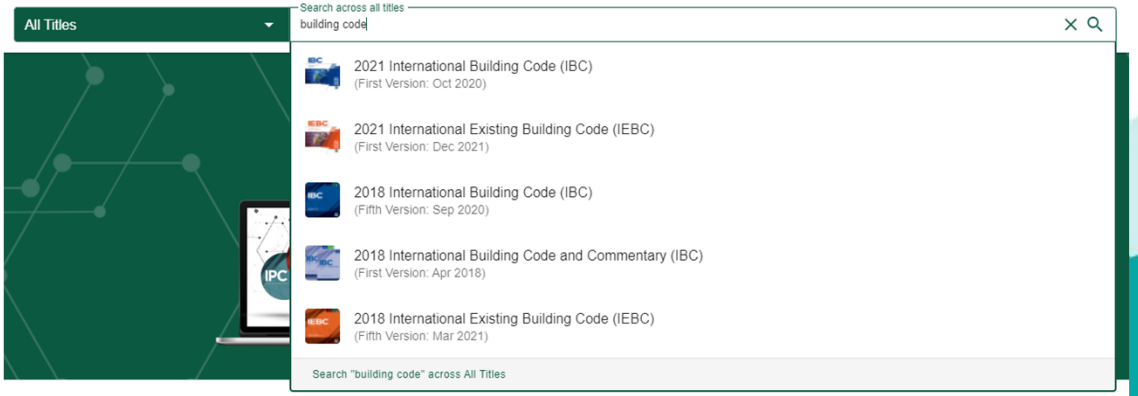
- In 2020 San Diego's Development Services Department had to move out of new office space for emergency repairs
- Permitting and inspections would have been nearly impossible without their codebooks to refer to
- Relocation coupled with pandemic led to over 40% of the department working from home
- Digital Codes Premium provided means to maintain productivity in a remote environment
- “We reduce the amount of paper used whenever we can. The staff is very excited about going digital, especially the younger ones. They do everything on computers. Digital access could even help bring in more young code professionals.”
    - Medhi Shadyab, P.E., J.D. Senior Structural Engineer

https://www.iccsafe.org/building-safety-journal/bsj-perspectives/pandemic-or-no-san-diego-sees-premiumaccess-as-the-wave-of-the-near-future/

Digital Codes

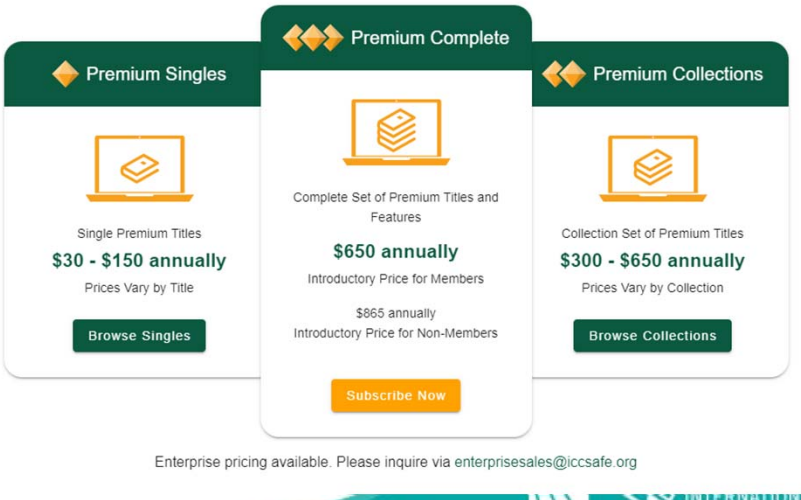
- Complete Codes Database with multiple ways to find your code titles
- 24/7 Access Available from any web connected device
- Basic Online Free View Available for 800+ titles
- Enhanced features promote efficiency in working with the codes





Digital Codes Premium

- Content Search
- Exclusive Content Offerings
- Follow references between chapters or across titles
- Bonus premium materials
- Flexible Subscription Offerings
  - Singles
  - Collections
  - Premium Complete



Complete Code Compliance

- International Codes
  - Complete Collections
  - All Versions available
  - Changed sections between cycles identified with red text
- State level specific codes
  - Custom collection titles with integrated amendments, errata and supplements
  - All Versions available
  - Changed sections between cycles identified with blue text

nal Residential
IRC)

2021 International Fire Code (IFC)

2021 International Fuel Gas Code (IFGC)

2021 In
Build

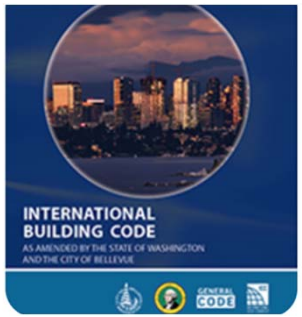
Custom Local Building Codes

- New Service offered through General Code – a member of the ICC Family of Solutions
- Local amendments integrated into a custom title and identified with fuschia colored text
- Enhanced features available to city staff and design professionals
- Growing number of represented locations
  - Harford County, Maryland
  - Howard County, Maryland
  - City of O'Fallon, Missouri
  - Guadalupe County, Texas
  - Bellevue, Washington

CITY OF BELLEVUE CONSTRUCTION CODE ADMINSTRATI

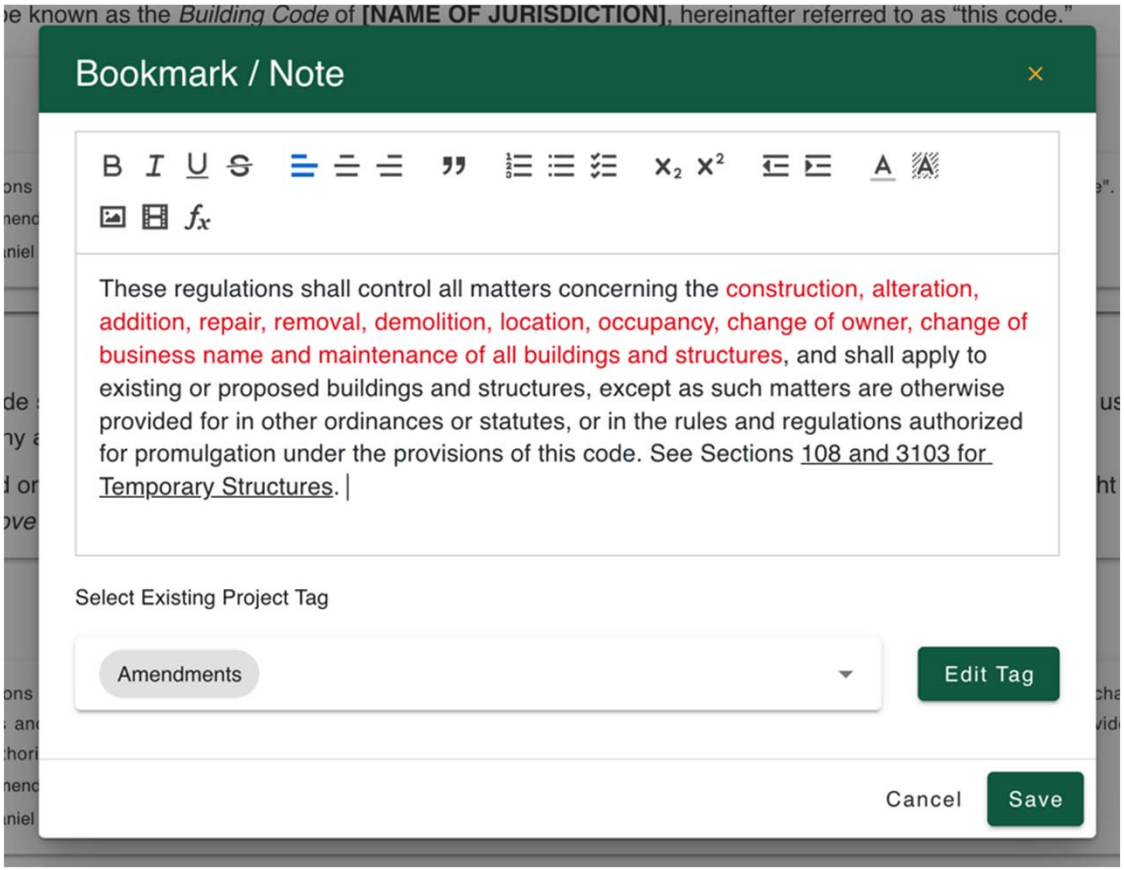
F OF BELLEVUE CONSTRUCTION CODE ADMINSTRATION replaces PART I of

ıtion, organization and enforcement of the technical codes adopted by the city. The
ough structural strength, means of egress facilities, stability, sanitation, adequate lig
ent and to provide safety to firefighters and emergency responders during emergen



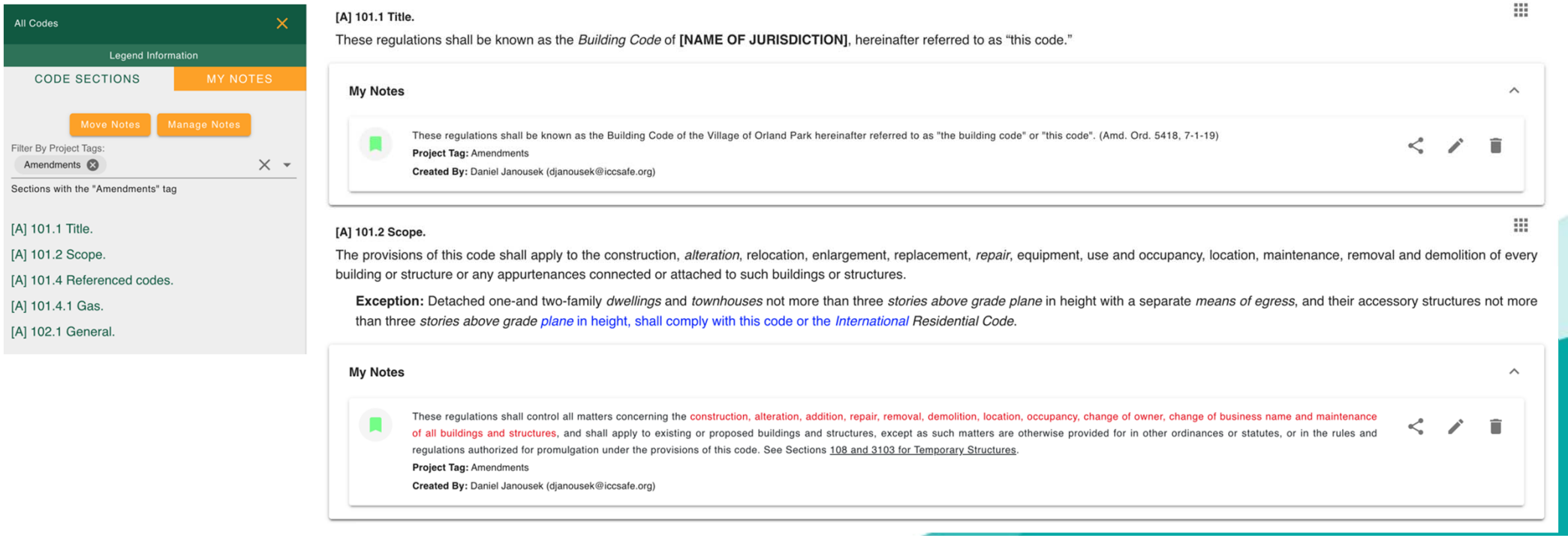
Notes For Amendments with Premium

- Identify code sections with amendments or changes to text
  - Markup messages with formatting (strikethrough, underline color) and color coding
- Quickly identify all sections in
- current title with an amendment
- Export for quick reference
- Share with other Premium users



Notes For Amendments with Premium

- Notes labeled with Project Tags and Displayed Inline to the Code

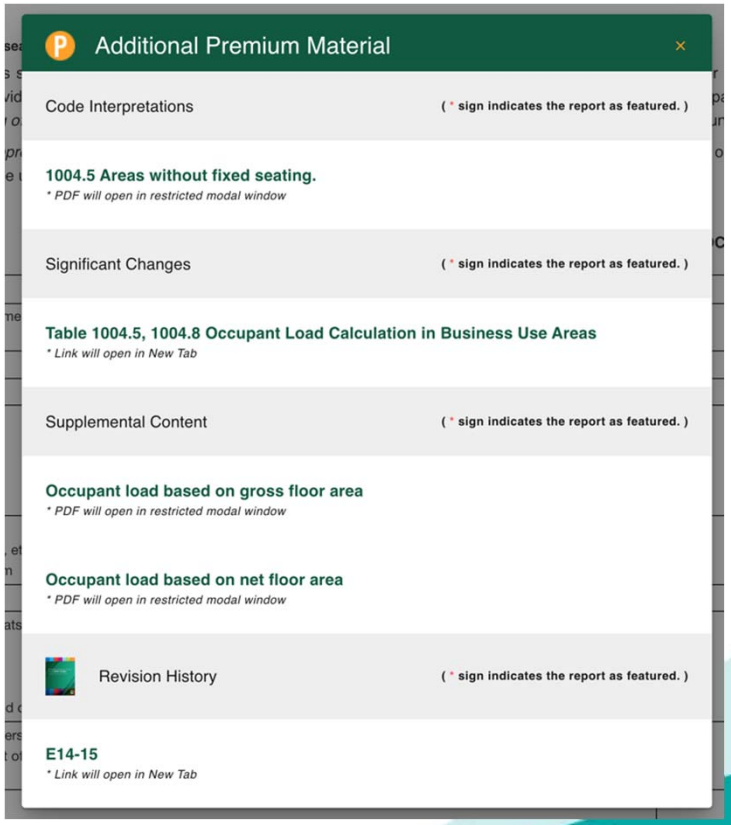


Digital Codes Titles

- Referenced Standards
  - Growing number of standards
- Supporting Documents on Applying the Codes
  - Commentaries
  - Complete Revision History
  - Wiley Resources
- Topic Centric Resources
  - Energy
  - Fire
  - Green and Sustainability
  - ANCR

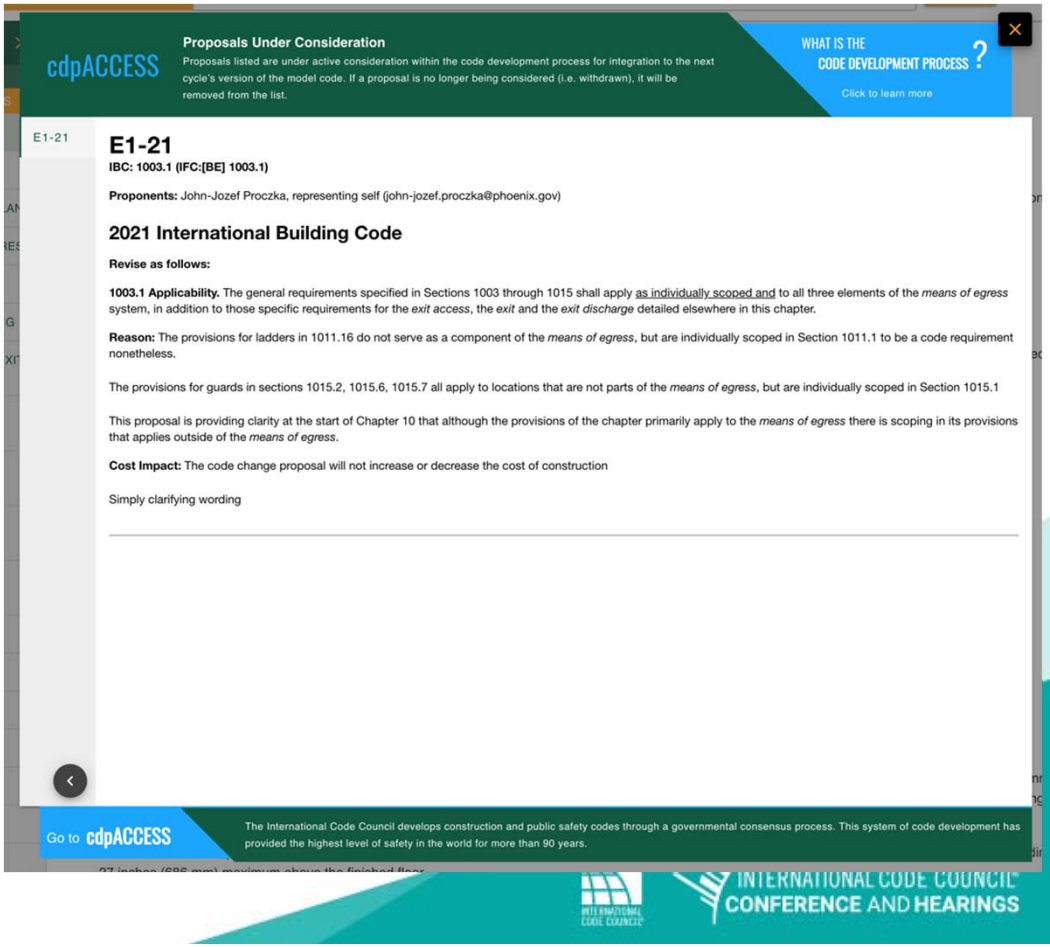
Supplemental Materials

- ES Reports
  - Building products are tagged across sections and chapters of the codes for which they are relevant.
- Errata Tags
  - Identified errata from ICC Errata Central tagged to specific version and section impacted by the change.
- Exclusive Premium Contents
  - Complete Revision History
  - Significant Changes
  - Code Interpretations



cdpACCESS Proposal Integration

- Tag impacted sections with cdp specific icon across 2021 I-Codes
- Promote awareness of proposed code changes within code development cycle
- Provide context around change (reason statement, cost impact)
- Encourage participation within code development process via cdpACCESS (public comments, online voting)

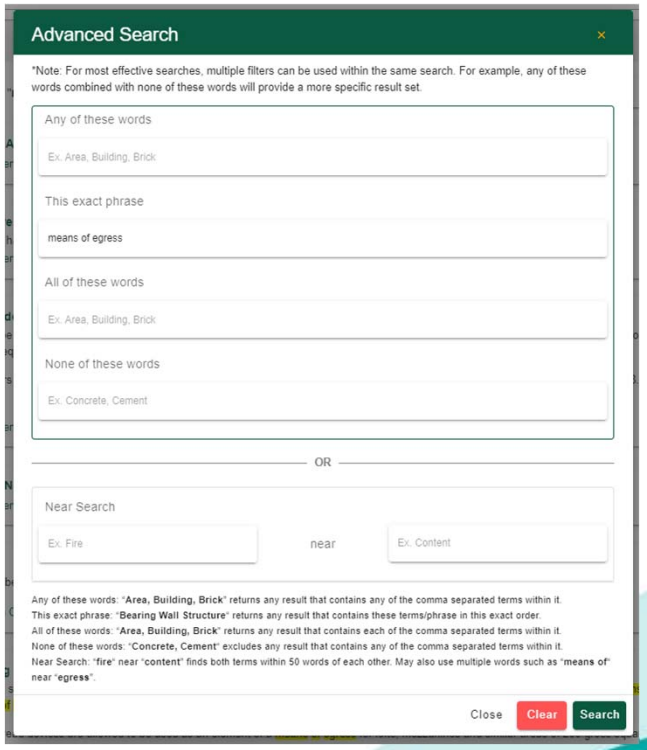


Keep Yourself Organized

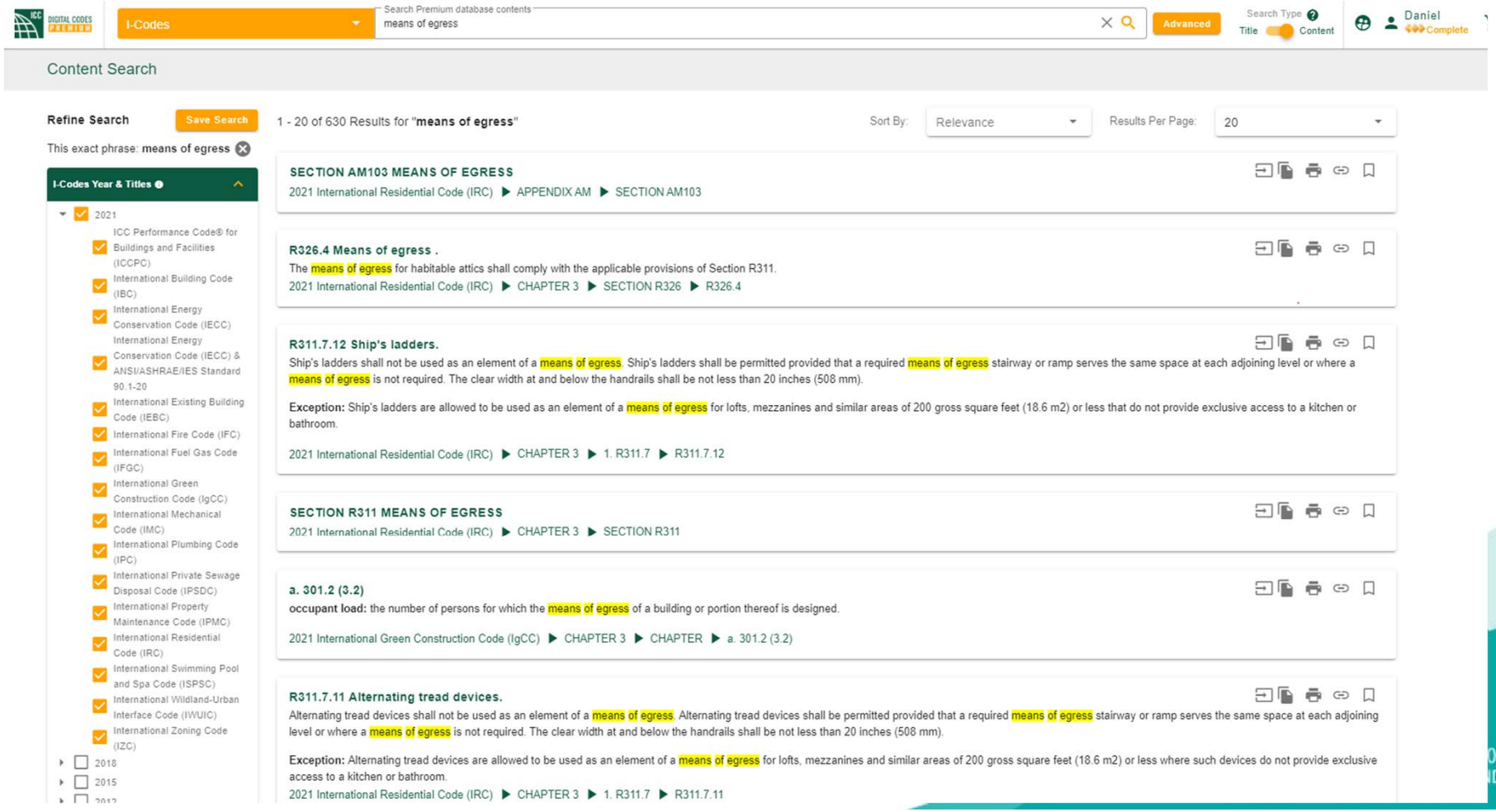
- Bookmark sections of interest
- Add text, files, images or videos to code sections annotations
- Categorize your bookmarks and annotations
- Share your notes with other Digital Codes Premium users or export to PDF

Advanced Search

- Keyword search for identification within specific code sections
- Advanced search controls allow targeted narrowing of result set
  - Any of these words
  - Exact Phrase
  - All of these words
  - None of these words
  - Near search
- Content type filter allows user to pull results from just tables or figures where relevant
- Share, Bookmark or Copy section text directly from search results page

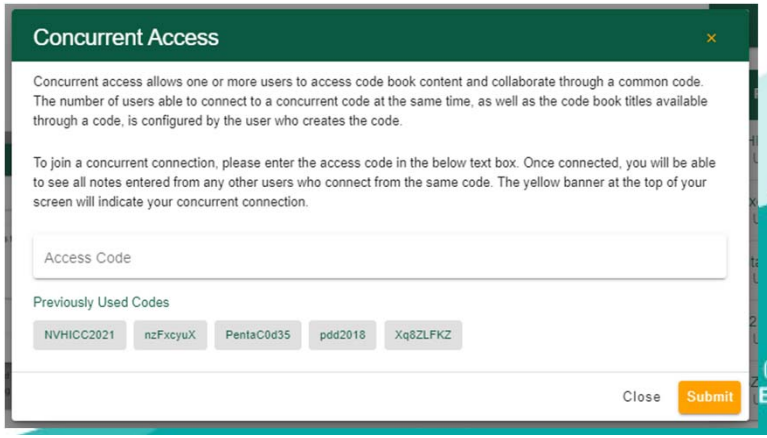


Advanced Search



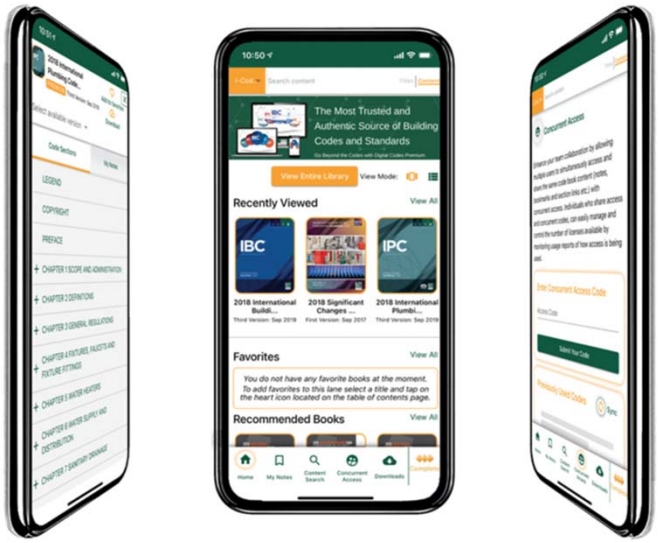
Premium for Teams

- Concurrent Access with Premium for Teams
- Premium features available for your entire team
- Seamlessly share notes across your team
- Access controlled by number of licenses available
- Usage Reports to Monitor How Access is being utilized



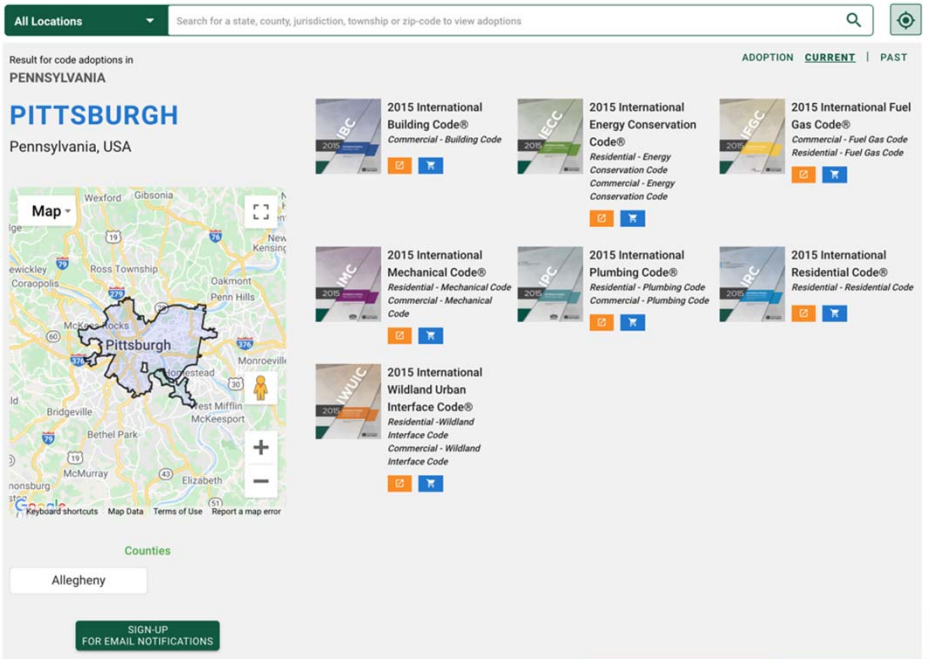
Digital Codes Premium Mobile App

- Native Mobile Experience for Premium subscription titles
- Advanced Search capabilities
- Syncing between Premium and Mobile App for titles and notes
- Offline Access for up to 15 titles
- Available on Apple and Android Devices



Adoptions Database

- Searchable Database of over 100,000 state, county and jurisdiction locations
- State and local level adoption information
- I-Code Adoptions Maps depict versions currently in effect by state
- Free online resource developed in coordination with FLASH and ISO
- https://codeadoptions.iccsafe.org



What's Next?

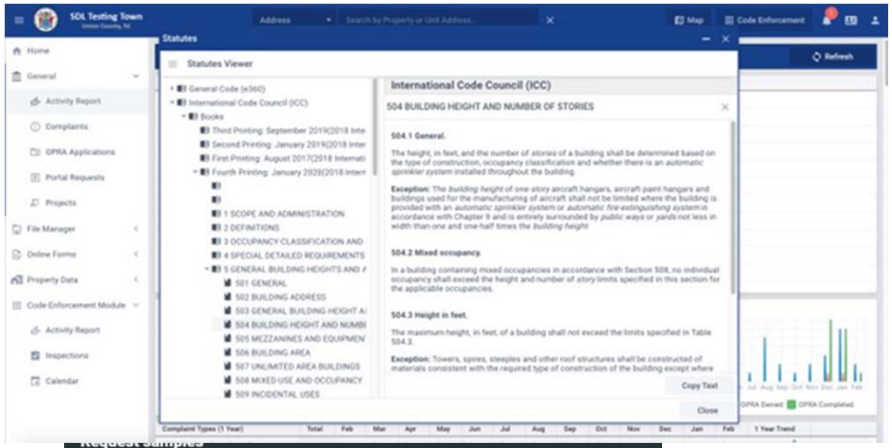
- Content Expansion
  - Standards Content
  - Supplemental Materials (Essentials, Study Companions)
  - Training Materials (Wiley)
  - Topic Specific Collections (Energy Collection)
- Certification Integration
  - Digital References for PRONTO exams
- Online Learning Subscription Plan
- Code Connect
  - Third Party Content API Integration
- Digital Codes Premium Enterprise
  - Solutions for Corporate and Large-Scale Organizations

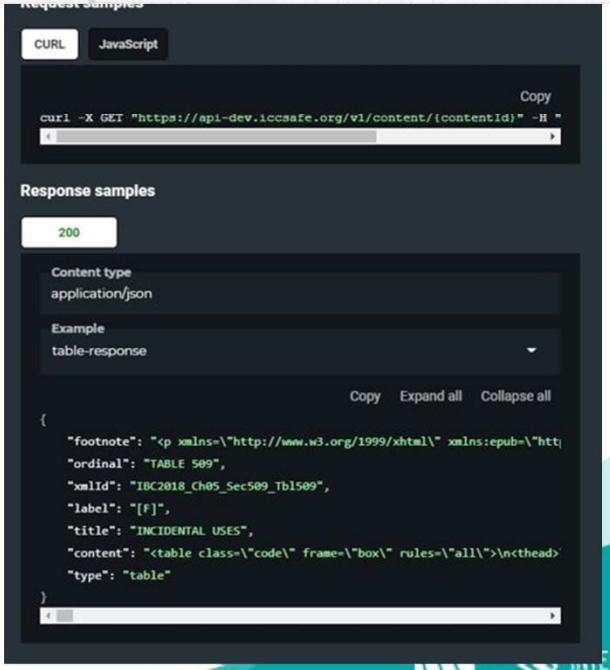
ICC Online Learning

- Digital Subscription Service
- All Access collection of training content
- Robust offering of over 150 online courses covering the most relevant topics in the Building Safety Industry
- Earn CEUs at your own pace

Code Connect API

- To leverage the Code Council's reach with authorities having jurisdiction (AHJs) and the AEC market segment to increase distribution and discovery of ICC content & tools
- ICC Code Contents Integrated into 3rd Party Applications
- Direct access to the trusted source with all versions
- Keyword search and extraction of code level contents





Digital Codes Premium Enterprise

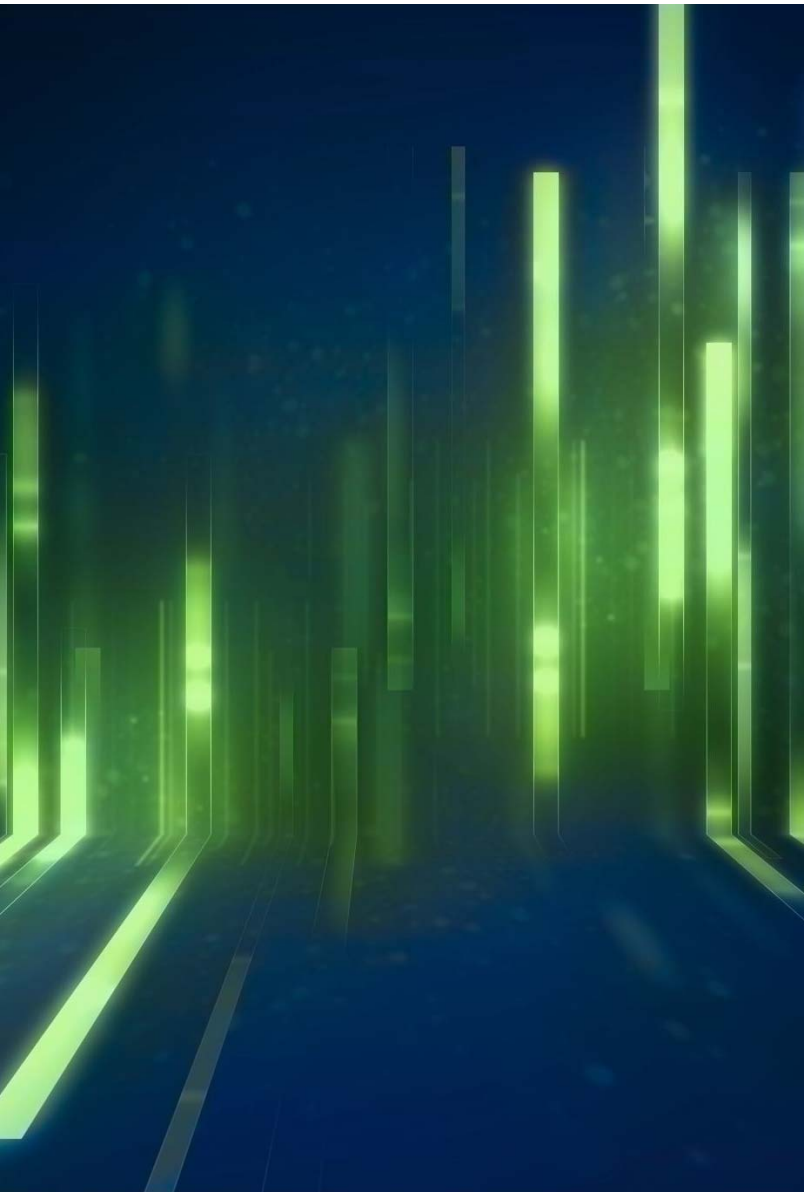
- Simplify the way your team researches, understands and applies codes and standards
- Digital Codes Premium Enterprise enhances enterprises' codes and standards experience with interactive features and advanced tools to search codes faster, share notes, collaborate, and manage building codes – ALL IN ONE PLACE
- Make building code research easier for your organization

Break

- Digital Codes Premium Shirt Giveaway after Break

Todays Presentation on the MPO

- Technology
- Online Permitting
- Electronic Plan Review
- RVI Process
- SolarAPP



What is the Model Program for Online Services (MPO)

Purpose and Scope

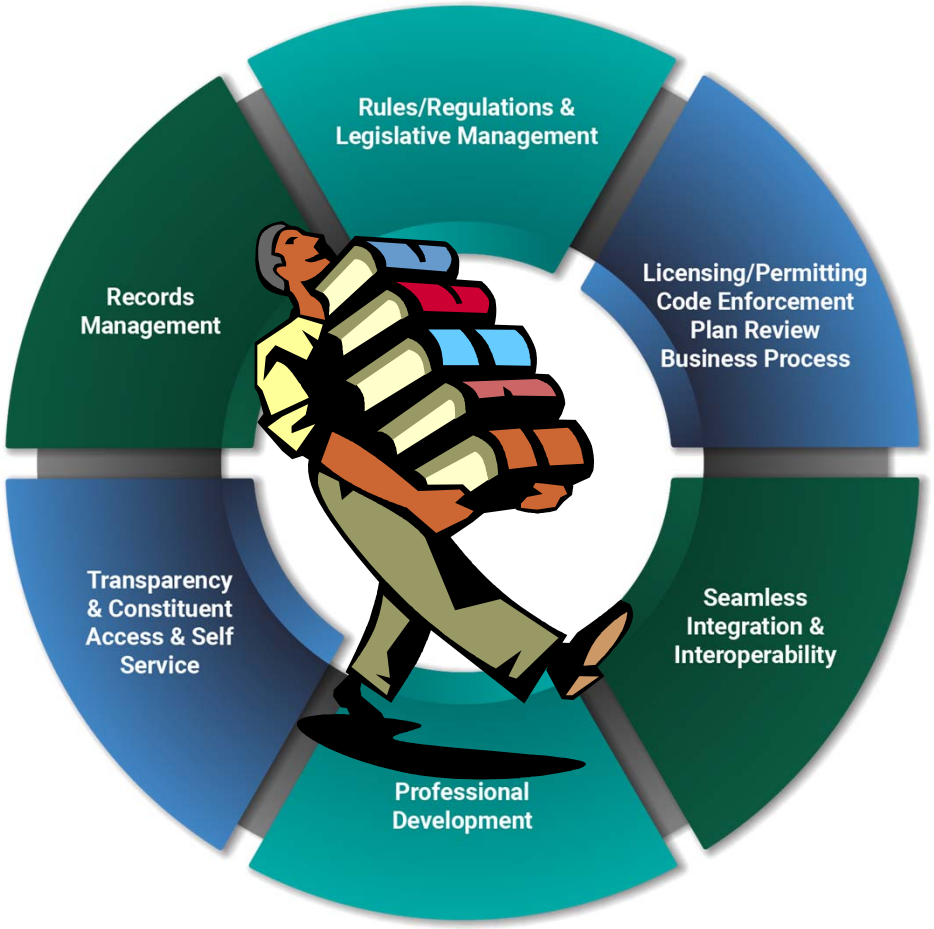
Provide guidance for the implementation processes to

- issue permits,
- provide plan review, and
- conduct inspections of projects remotely

The MPO addresses items related to the above goals and criteria (implementation and enforcement).

The MPO is not written in enforceable language

Technology Use



Information technology

- Enables building departments to automate and streamline the building department processes by using a set of digital tools or services.
- The intent of electronic solutions is to improve processes and records management by
  - allowing customers to apply online,
  - reducing permitting timelines,
  - eliminating paper printing and storage, and
  - minimizing carbon and environmental footprints.
- Electronic solutions improve customer service and staff efficiency,
- Enhance quality and make operating funds more productive.
- An electronic solution system typically replaces traditional paper and file-card systems.
- In short, information technology can benefit both the building department and its constituency.

Technology Use

It can consist of a simple software tool for tracking permits, reviewing plans and scheduling inspections or it may contain a broad array of task-specific tools for:

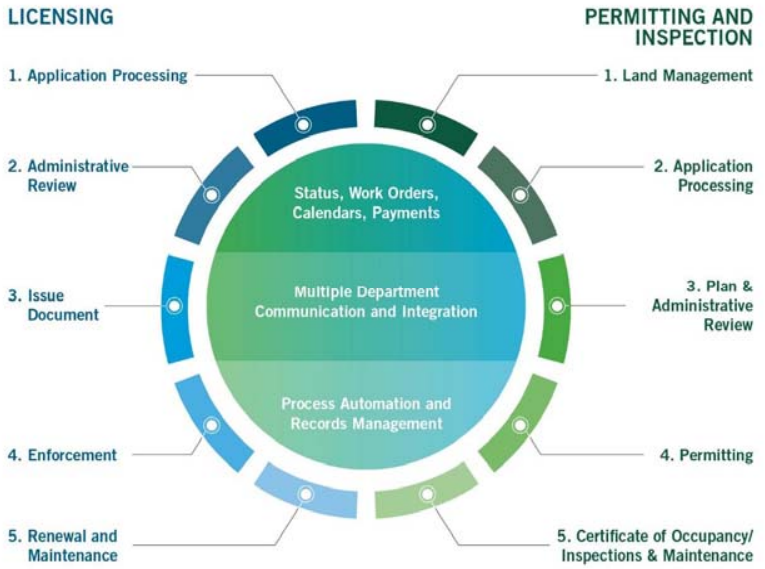
- plan review
- issuing and tracking permits
- inspection scheduling
- performing inspections
- posting inspection results
- project tracking
- fee calculation and collection
- workflow management
- reporting
- record keeping and permit documents archival
- coordination with other government departments

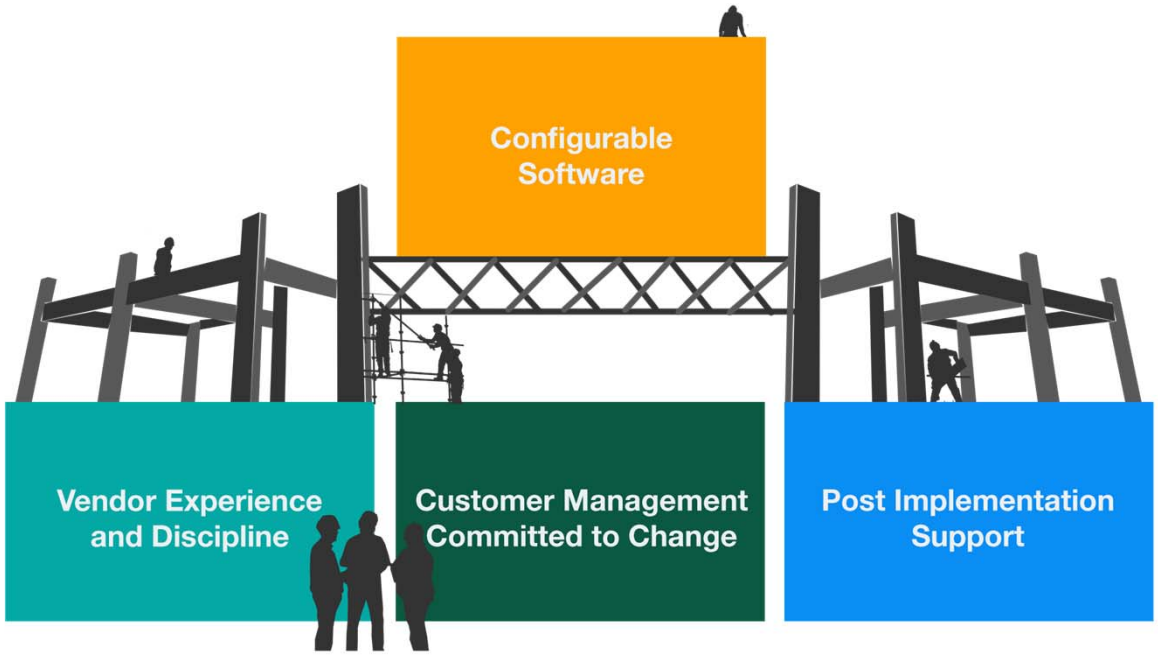
Challenges of implementing new software

- Jurisdictions are busy and often an under-resourced operation
  - which is frequently overlooked when jurisdictions consider a software solution.
- Successful deployments of the software will typically be complete in a few month's but
  - it will often take 18 to 24 months before the new application is seen as user friendly
  - Jurisdiction IT staff oversight and participation

Leadership commitment and involvement is critical

- Vendors are limited in their ability to address resistance to change which is a natural part of the implementation process.





Selecting a Solution

- **Standalone Function-Specific Solutions**

Standalone software solutions that solve specific problems presented in the digital transformation of a building department.

- **Independent Integrated Solutions**

Independent Integrated Solutions generally have a robust community development software solution as a hub system

Supports the key building functions as well as a few very tightly related departments such as code enforcement, planning, zoning and others.

- **Enterprise Platform Solutions**

A single software platform that fulfills all of the major functionality involved

building, planning, zoning, DPW and asset management, finance and the other major operational components including plan review

Online Permitting

Improve customer service

Streamline the permitting process

Allows customers to apply for and obtain Commercial Building Permits 24/7, and

Residential building permits on-line 24/7

- Records Management
- Cost savings and Operational Efficiency
- Enhanced communications with the applicant
- Direct revenue and other sought out data reports' generation
- Integrated system with electronic plan review, building inspections and other online services
- Citizen access for look up and status check
- Inspection results may be uploaded live for the project's proponent use
- The ability to modify permit information as the project scope change
- Generating automated plan check and permit expiration notices to the owner and applicant on record.
- Automating the issuance of the Certificate of Occupancy by populating the project data field directly from the permit document

Recommended **Features**

- Flexibility and customization
- Ability to integrate with existing software and application such as GIS and Finance
- Can be modified easily to apply for other permits or actions such as
  - Encroachment permits
  - Grading permits
  - Fire permits
  - Maintenance permits
  - Business license
  - Other permits

Continued

Recommended **Features**

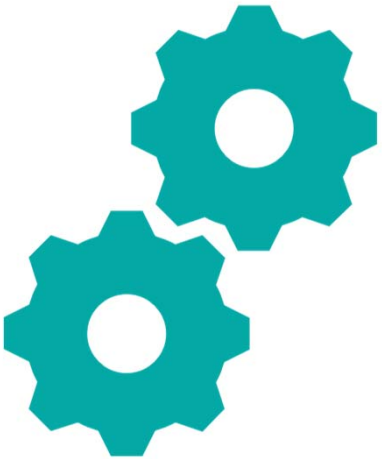
- Can be easily upgraded
- Work with a variety of fee collections methodologies
- Ability to hyperlink to outside agencies involved in the permitting process such as contractor's license lookup, design professional licensor information and property identifiers such as Tax Assessors' records etc..
- Connectivity to other city actions linked to a property
- Allows the placement of Lock/Holds and Notices on a given property
- Allows the placement of other restrictions such as fire hazard zones and flood zones.

San Bernardino County – Dashboard

- https://www.youtube.com/watch?v=IMzwTy5xQw8&list=PL0NuOovxpBhzkiG-KKfFsdDZ4JYjW0aoq&index=4

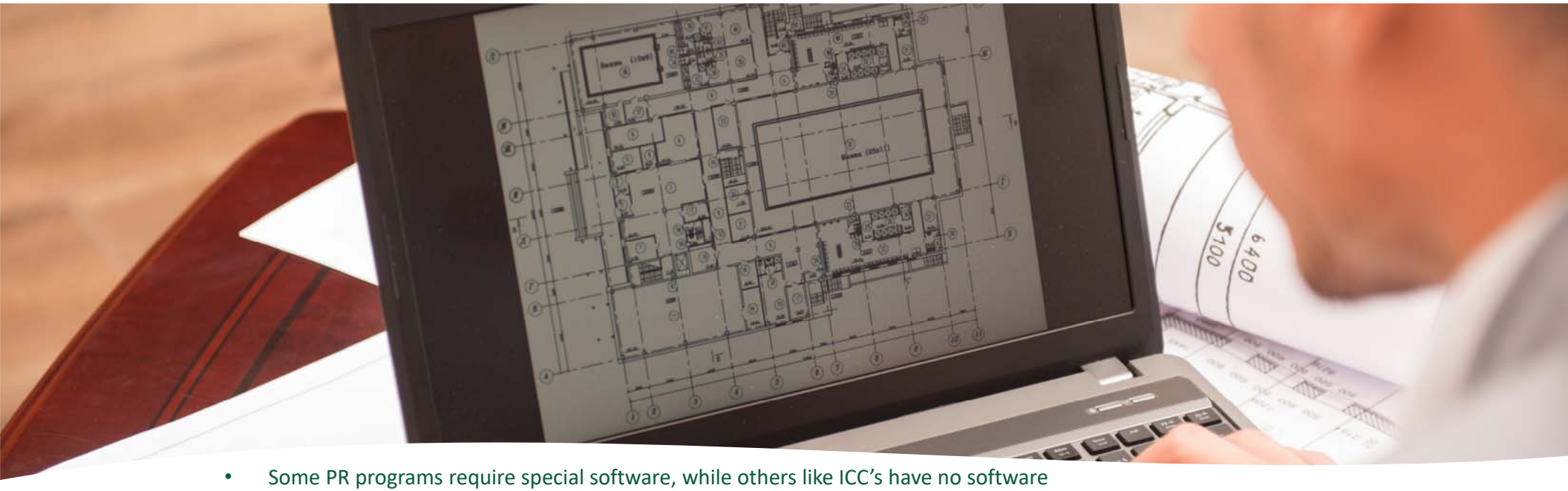
"It'll never fly."

PLAN REVIEW



Electronic Plan Review - EPR

- Process is not NEW
- Most jurisdictions use a basic automated system
- Matter of preference for what works best for departments and their own workflow
    - All systems have pluses and minuses
    - Many jurisdictions use as an administrative tool or permit system to track progress, count number of plan reviews, and correlate with permitting, inspections and accounting.
    - Some programs allow direct technical communications to occur
- Overall Plan Review systems, processes and programs continue to advance



- Some PR programs require special software, while others like ICC's have no software requirements.
- Features in programs that don't require specialized software can include
  - Dashboard to show current and past review progress and reports
  - Direct submittal forms of what codes to have reviewed
  - Download construction documents in PDF format
  - Customized workflow to specific needs
  - Add different users with different activities
  - Submit construction documents at a later time
  - Request free quotes electronically
  - 24/7 access

jE1

• Electronic Plan Review Process

EPR form submitted into the system

Customer Submits required plans and documents including permit application in accordance with the policy of the jurisdictions

- Submit all applicable or supporting documentation
- Print sizes and File Format should be in the format required by the jurisdiction
- Security Settings set to “Allowed”
- Arrange plan/bundles in the order specified by the jurisdiction

Once all documents are received the applicant will be notified if anything is missing or incomplete from the plans.

Review comments are consolidated and sent back to the applicant for changes and resubmit plans

The resubmittal process will take as many times as necessary

Slide 47

jE1 Not sure what that orange receycle sumbole is in the middle.
jay Elbettar, 9/8/2021

Submitting & Tracking Documents

Electronic submittal is intended to speed up process, but these are tips to help the process go smoothly

- Bundle drawings into discipline or break down into volumes
- Submit bundles separately
- Don’t submit individual sheets

Most Programs allow Tracking

- Allows updates and see exactly where process is
- Some programs have real time plan review available
- Notifications sent to customer on progress updates
- Notifications sent when review is complete and detailed report is sent

Challenges related to online reviews

- Electronic services tied into online payments
- Zooming in on images and scrolling through pages takes a lot of patience and practice
- Building Departments can get overwhelmed with online plan review services
- Managing different reviewers and different submittal cycles. Some software programs allow layering with different colors distinguishing various reviewers

Plan Review Software

- Bluebeam
- Project.dox
- e-PlanReview
- Sire Technologies
- Adobe PDF
- Oracle

ICC International Code Council

PLAN REVIEW

City of Salem, Oregon's Project Coordinator

- **Project Coordinator** is automatically assigned to commercial projects with valuation of ***$10 million*** or more, or that are high-profile, politically sensitive, complex or unusual.
- **Project Coordinator** services are provided at ***no additional charge.***
- **Project Coordinator** ***facilitates*** moving projects through the regulatory processes from the pre-application stage to final occupancy approval.
- **Project Coordinator** ***manages*** Request for Information (RFIs), change orders, and revisions.

2021 INTERNATIONAL CODE COUNCIL® CONFERENCE AND HEARINGS

Building Inspections

What is Remote Virtual Inspection (RVI)?

- A form of visual inspection
- Uses visual or electronic aids
  - Allows inspectors to observe products and/or materials from a distance
    - **Purpose**
      - Provide more efficient building inspection services
      - When sites are in dangerous environments
        - To minimize human contact
        - where circumstances or conditions prevent an in-person onsite field inspection.

REMOTE VIRTUAL INSPECTION – RVI

(AKA video and visual)

WHAT IT IS - Definition

RVI, is a form of visual inspection which uses visual or electronic aids to allow an inspector or team of inspectors to observe products and/or materials from a distance because the objects are inaccessible or are in dangerous environments, or whereby circumstances or conditions prevent an in-person inspection.

Purpose of the RVI Resources

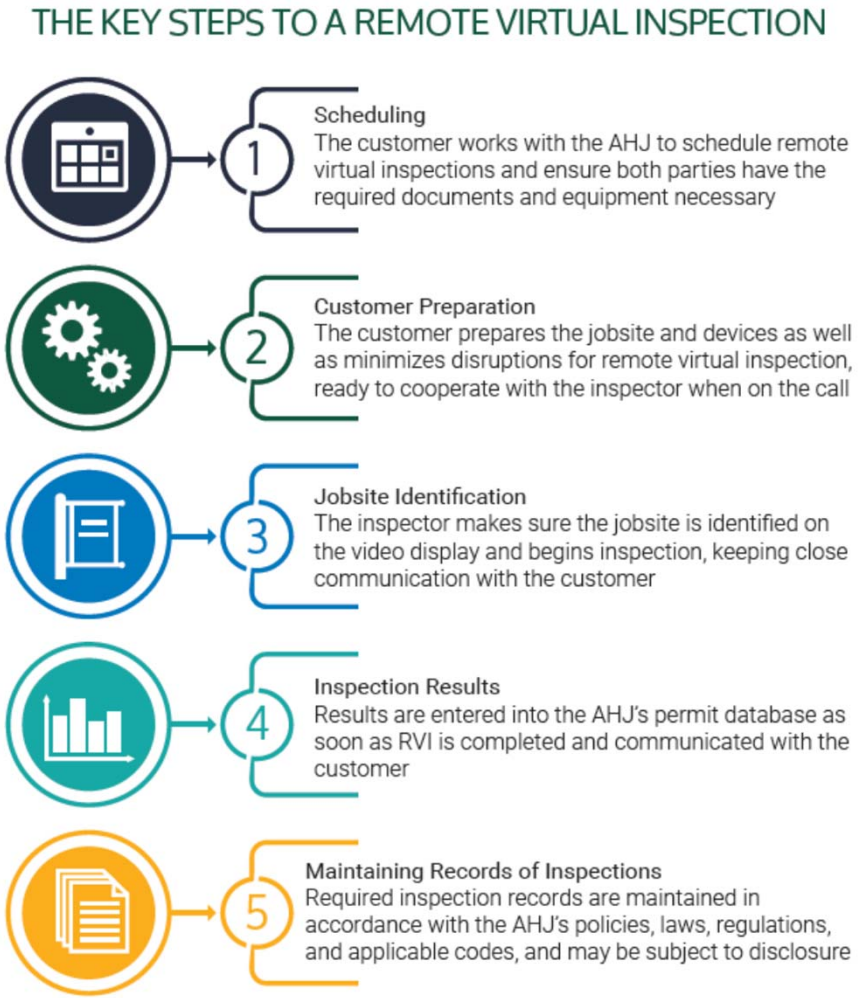
After the pandemic hit, jurisdictions were looking for ways to keep everyone safe and many were looking for ways to implement remote inspections

Why Use RVI?

- Today's phones and tablets have powerful capabilities for real-time, online communication
- Allows construction projects to continue without impediment
- Allows AHJs to continue providing essential services needed to ensure the safety of the built environment
- RVI benefits both jurisdictions and customers

ICC International Code Council

Key Steps for Remote Virtual Inspection



- Remote Video Inspection - Bing video Tucson

RVI Scheduling

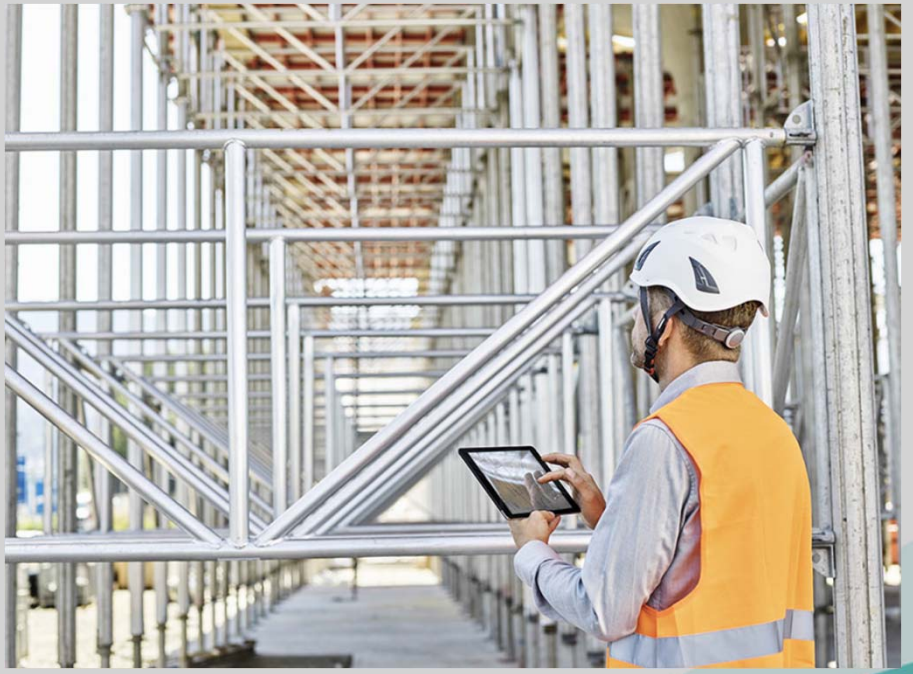
AHJ Requirements:

- Require lead time
- Sufficient Time for Type of inspection
- Time slots
- Platform (Facetime, Skype, Google Duo, etc.)
- Confirm qualified inspection type
- Provide confirmation to the customer

ICC International Code Council

RVI Scheduling

- **Customer Requirements:**
  - Active permit
  - Sufficient Time for Type of inspection
  - Confirm Platform (Facetime, Skype, Google Duo, etc.)
  - Confirm qualified inspection type
  - Confirm with jurisdiction



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RVI Process - Customer Preparations

Image	Turn off	Minimize	Tools	Be
Image Quality	Turn off notification to avoid interruptions	Minimize jobsite disruptions • Background noise	Tools for the type of inspection must be onsite	Be ready to receive the call on time

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RVI Process - Jobsite

- Safe for person handling the device
- Device is fully charged
- Hi Speed WiFi or cell service with a strong signal
- Good lighting and visible
- Tools available onsite
- Plans & permit card available

RVI Process - Inspection

- Begin video at the street
  - Geotagging/GPS
- AHJ establish and clearly communicate directions
- Customer must be cooperative
- Minimize interruptions
- RVI Participation Agreement

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RVI Process – Inspection Results

- Results are entered into system following inspection
- Available for Customer review
  - Inspector may send results electronically
- Corrections noted
  - Schedule reinspection
  - Optional – inspector may permit video of corrections
- Utility tags
- Record Maintenance

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RVI Inspection Types

- **Plumbing system repairs or fixture replacements.**
- **Construction trailer installations.**
- **Swimming pool excavations.**
- **Gas line repairs or gas utility clearance.**
- **Electric utility clearances.**
- **HVAC direct replacement or repair.**
- **Minor residential electrical.**
- **Insulation**

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RVI Inspection Types

- **Miscellaneous repair/exterior repair or upgrades (stucco, windows, etc.).**
- **Re-roofing/roof covering replacement.**
- **Water heater or water softener direct replacement.**
- **New residential plumbing rough-in.**
- **New residential rough framing inspections.**
- **Residential rooftop-mounted photovoltaic panel systems.**
- **HUD manufactured home installation verification.**
- **Any other inspection approved by the AHJ.**

RVI Inspection Challenges

- Connectivity/Technology
  - Video and/or Audio
- Ensuring correct site location
- Ensuring correct location within the building
- Insufficient data to demonstrate compliance
- Complexity of the project
- Inadequate tools onsite
- Length of time for inspection

RVI Inspection Benefits

- Health and safety benefits
- Customer - Schedule an inspection time
  - Able to plan around schedule
  - Pre-determined length of time for inspection
  - Jurisdiction - Eliminates drive time
  - Saves time and resources
  - Reduces GHG

RVI Inspection Challenges

- Connectivity/Technology
  - Video and/or Audio
- Ensuring correct site location
- Ensuring correct location within the building
- Insufficient data to demonstrate compliance
- Complexity of the project
- Inadequate tools onsite
- Length of time for inspection
- Qualified owner representative available

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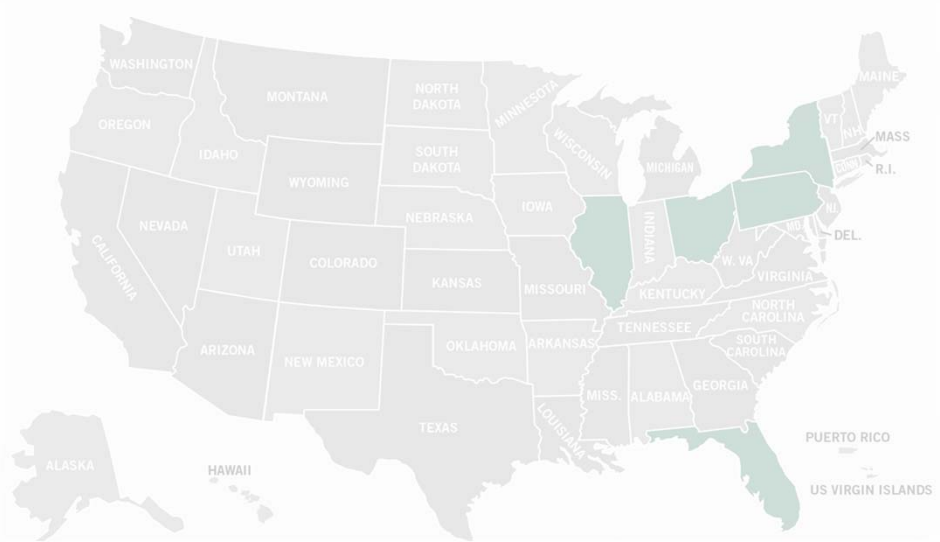
RVI Inspection Education

- Training
  - The RVI process
  - The various video platforms/software
  - Communication skills

- Training for Customers
  - Job site expectations
  - Scheduling protocols

RVI - Special Inspections

- **Special Inspections**
  - **High Strength Bolting**
  - **Welding**
  - **Concrete**
  - **Others**



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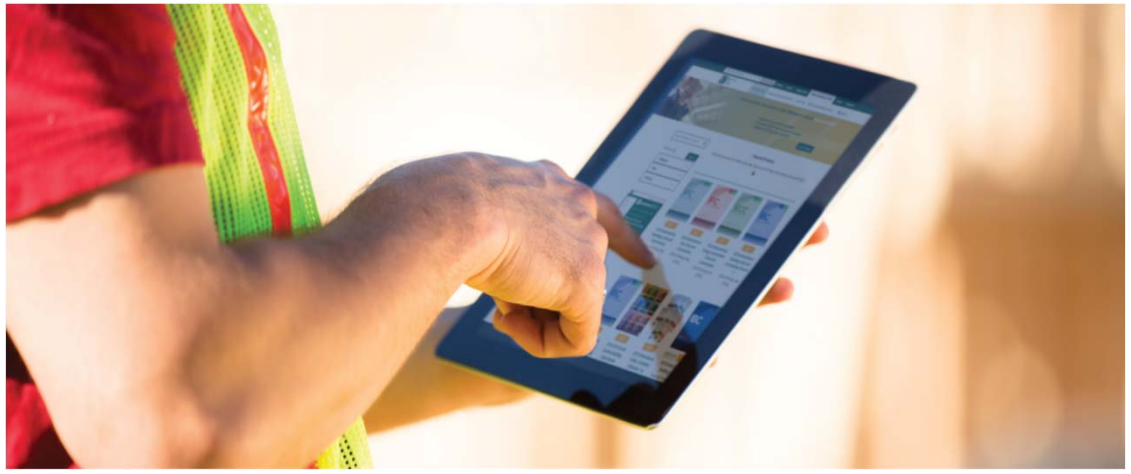
RVI Resources

- ✓ [ICC Coronavirus Response Webpage](https://www.iccsafe.org/advocacy/coronavirus-response-center/)
  (https://www.iccsafe.org/advocacy/coronavirus-response-center/)

  List of Jurisdictions
  Software Availability

RVI - Software

- Municity
- Inspected.com
- Blitzz
- Others



RVI – Example Jurisdictions

Alexandria, Virginia	Arlington County, Virginia	City of Austin, Texas	City of Fort Collins, Colorado	North Carolina Code Officials Qualification Board
North Carolina Department of Insurance	North Las Vegas	Los Angeles County Video Inspection Process and Inspection Guide for PV Systems For One- and Two-Family Dwellings	City of Los Angeles Department of Building and Safety Virtual Inspection Program	Many others around the country

- Transforming Edmonton: Remote Video Inspections - Bing video

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Future of RVI

- Many jurisdictions have made it permanent
- Energy related standard and protocols

Resources

www.iccsafe.org

Free Public Access to Codes

https://codes.iccsafe.org/

Recommended Practices: Remote Video Insp.book (iccsafe.org)

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Installer submits an application with design specifications through SolarAPP

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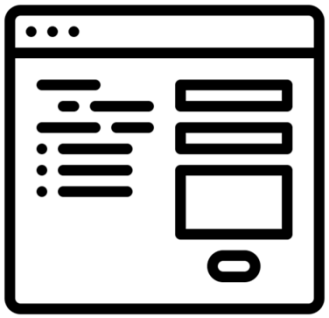

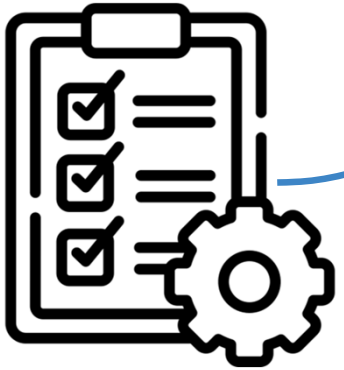

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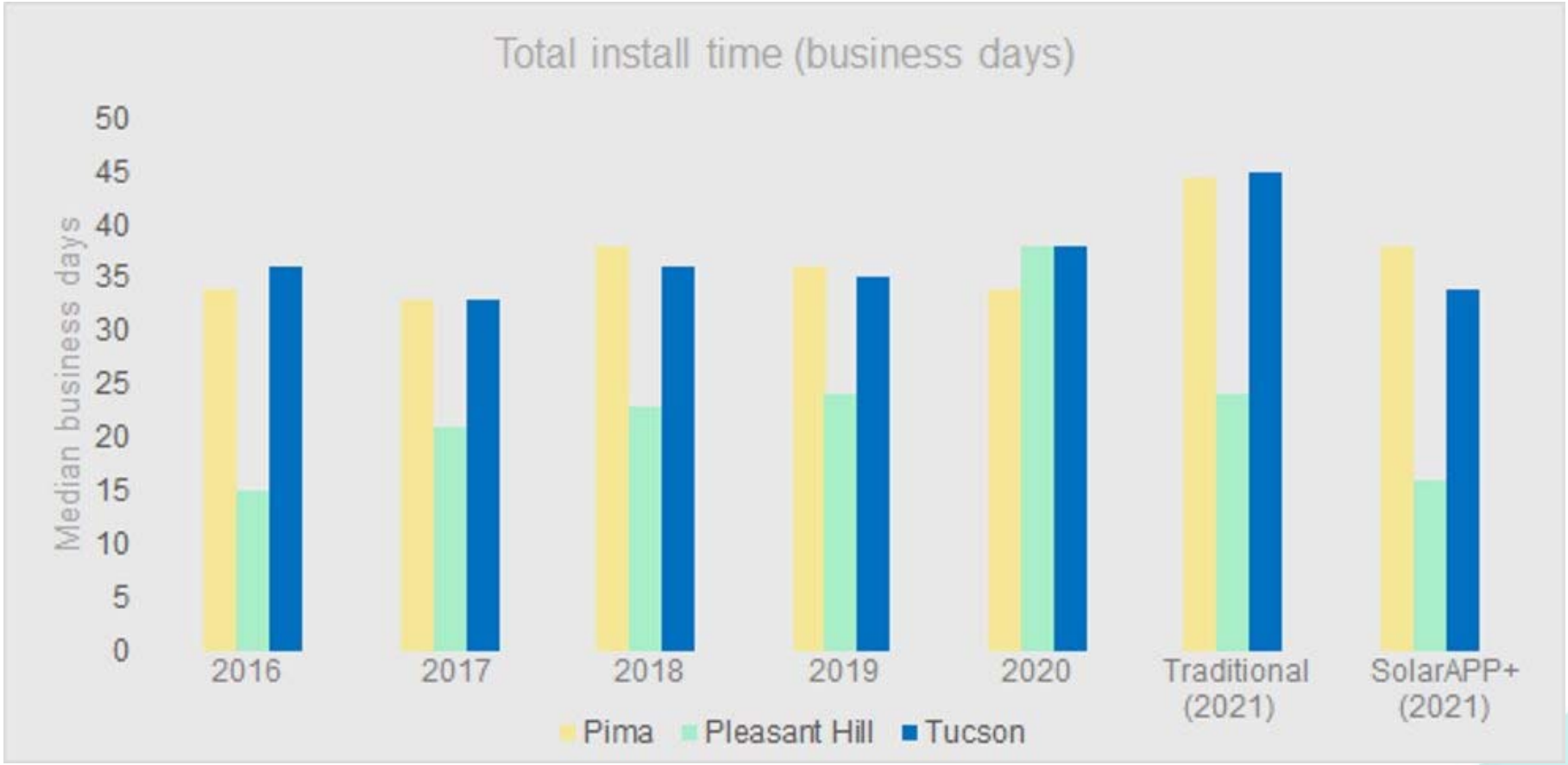

SolarAPP+ significantly reduces install times

PRELIMINARY DRAFT RESULTS: DO NOT CITE

Time Savings for Local Governments

Permitting Time Saved by SolarAPP+							
	Mean permit review time (hours)	SolarAPP+ Permits	Time saved on permit review (hours)	Mean Permit Revision Time (hours)	SolarAPP+ Revisions	Time saved on permit revision (hours)	Total time saved (hours)
Pima County, AZ	1	54	54	0.75	11	8.25	62.25
Pleasant Hill, CA	0.25	19	4.75	0.20*	41	8.20	12.95
Tucson, AZ	1	76	76	0.75	47	35.25	111.25
Totals	-	149	134.75	-	99	51.7	**186.45**

- Time saved during SolarAPP+ pilot: 186.45 hrs
- **Estimated time saved since launch: ~420 hrs**

PRELIMINARY DRAFT RESULTS: DO NOT CITE

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- **Thank You**

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