

## Mission

**The Sustainable Laboratory User Manual is envisioned as a living resource that describes a facility's sustainable purpose.** This Manual enables laboratory owners, operators, and occupants to intelligently use, maintain, and renovate the building over time. Infrastructure functionality and optimal operations are collated into an open sourced, expandable framework that delivers a comprehensive view of facility safety, flexibility, sustainability, and resilience.

### The Sustainable Laboratory User Manual is envisioned as:

- **GOAL:** documenting performance goals
  - Establishing **performance goals**. Energy usage. Water usage. LEED. Capturing **facility performance**. Sustainable. Air quality / ventilation rates.
  - Monitoring / measuring the performance. Using the I2SL benchmarking tool. LEED dashboard? Expensive / ignored? Energy use displays / real time feedback, very simple.
- **GOAL:** responding to change
  - **Renovate the lab**. Fumehood capacity. **Converting the labs** to much greater intensity. Capture the design criteria used for initial design > to inform future renovations. Documentation. LVRA / LVMP.
  - Flexibility below the ceiling and Adaptability holistic building, expandability.
  - **Redundancy** of systems
  - **Risk factors** and **recovery** measures (resilience)
- **GOAL:** considering occupants
  - Safety information
  - Integrated room inventory: fiscal, PPE, maintenance, chemical inventory.
  - Wellness and health
  - Occupant comfort,
  - Emergency response
  - Guidance at the **user level**. Enable those in the facility to achieve / maintain / gain performance. Empowering occupants. Help the users understand the intent of the building.
  - **Agreement for** the occupants of the building to operate in a sustainable way. Integrating with facility **training processes**.
  - Capturing required training. Training of the lab users.

- Capture safety training. First responder. User training for **disaster response**. Planned as the building is designed. Maintenance personnel often get the first call, but may not know what to do.
- **GOAL:** maintenance
  - **Infrastructure report card**. Listing of MEP systems / capacities / age of equipment.
  - **Service level agreement** for each room/zone: temp, air, water, service, cooling, custodial. Contains a basic level of service. Anything above that level of service requires PI to pay extra? Lab types
  - Capture **safety training**. First responder. User training for disaster response. Planned as the building is designed. Maintenance personnel often get the first call, but may not know what to do.
- **GOAL:** reference bank
  - Capturing information on fumehood specifications.
  - As-built facility information. Understanding what is installed. Digital twin of the facility.
  - Putting QR codes on the physical equipment.
  - Functional performance tests / commissioning reports.
- **GOAL:** ease of use
  - Important to describe how the Lab User Manual is different from the standard O&M / turnover documents. Setup a format. Not much extra work, just telling the contractor how to organize / where to put the data.
  - Framework / kit of parts. A la carte.
  - Resilience
  - Getting collaboration from different facility stakeholders. Common goals / shared understanding. **"Commissioning the team."** Periodic stakeholder assessments. Make sure the efforts are aligned and integrated. Maintenance, design, safety, occupants, sustainability, finance.
  - Enable personnel assessments. Take credit for successes. Enable continuous improvement.
  - Capturing the most up to date information. Integrating updated info. Storing data in consistent way. Different levels of detail. Expandable, easily revised.
  - Can the guide help the owner get organized?
  - Survey of lab owners about how documents are stored.

- 3<sup>rd</sup> party data manager? Data management service?
- Design team provides a service to organize the data into a manual format.
- Repeat service?
- Next Steps 6/30/2020 initial FORMAT notes
  - **Security levels**
    - Intranet hosted rather than internet for safety purposes.
    - Collaboration software integrated
    - Log in / sharepoint site with teams site
  - Knowledge management platforms – knowledge architecture (functions like wiki / facebook)
  - Training information
  - Where it's hosted?
  - Who do we target with the beta version? – cloud based or internal host
  - Export to PDF. (not much security) Microsoft products allow for better security capabilities
  - Including monitor feedback from building performance – power BI
  - Visualization: Power BI, tableau – **User Interface:** engineers, lab users, admin
- 7/14/2020 FORMAT WORKSESSION
- Attendees: Christopher Kleingartner, Dan Doyle, Steven Webster, Blyth Vogt, Phil Wirdzek, Dave Swanson, Allen Doyle
  - Discuss what information would be output in order to develop the tool to share.
  - What is the goal?
    - Version 1 goal:
    - Version 2 goal:
  - What does the beta version look like?
  - Use a sample project to develop this tool. A project that is recently completed design would be ideal since team is still together. Owner is involved and how the owner manages the building.
    - Suggest to use a new building, moderate size, pursuing LEED certification.
  - Can this tool be used to document / influence design direction, not just document. Pull in benchmark and data as a tool.

- EUI database

Information Output	Tool to share
Laboratory Planning	Modeling of building, use I2SL tool to validate design.
Laboratory equipment	
Building Systems	What are the current trends that the building could achieve? Use a tool to take a program of a building
Arch Building Design	
Policy / Other operational programs	

- Steve Webster showed example of Perkins and Will Power BI benchmarking platform.



- Power BI is free with Microsoft 365 account. No back end server required.
- Security of data is important. This initiative collects data on behalf of I2SL for research purposes.
- Dave Swanson has similar example of Power BI.
- Blythe Vogt discussed examples of a benchmarking tool that AEI developed. Lab equipment input and selection.
- Caution on asking people to provide data, this format intended as manual output. Not effort to recreate effort or documents that already exists.
- Christopher K and Phil W will connect with Otto, propose he presents Smart Labs Tool development . <https://smartlabs.i2sl.org/index.html>
- Allison Farmer connection <https://lbt.i2sl.org/> and get lessons learned from developing this tool.
  - Valuable resource for benchmarking energy.
- Allen Doyle recommends documenting the larger equipment, over a certain wattage and/or consider watts/sf. 3-5 watts / sf. Although most labs are built for 10-15 watts/sf.
- I2SL best practice guide is currently under update. The lab user manual may recommend as a reference.

- Lab User Manual to contain page of references. Dan Doyle indicated multiple available references <https://www.i2sl.org/resources/bpg.html>
  - New sections include:
    - Resilience in laboratories.
    - Ductless fume hoods
    - Building analytics platforms
    - Design of crime labs
- Laboratory planning risk assessment under smart labs could be included as a link in lab planning.
- The user manual should be easy to gather info on how it was designed, what was intended to do, how it's operating. Not too overwhelming so it can be used.
- How do I know that I'm doing the wrong thing?
- A live tool that you can enter in data that can tell you it's the wrong thing. Collecting info, real time. Gives feedback. (reference the seat belt warning sign!)
- The manual can provide **parameters** in first version. If the institution can monitor parameters, they can use the building management system and alarm.
- How do you monitor how it's operating against that?
- How this could compliment BAS systems?
- GBA building analytics tool – using python – building owners can use to operate their buildings better. Honeywell Skyspark (IBM based program), Coppertree are examples. Coppertree is not user friendly.
- Rate fault protection software?
- AEI has built platforms for clients. Set up KPI to have parameters to measure against.
- What analytics platform is the building using?
- Dave Swanson indicated that DLR uses Skyspark and is interested in including Power BI. Dave to share more about how that is accomplished and if that is applicable to this effort.
- Don't want this format to:
  - Recreate documents already existing.
  - Over complex system
  - This is not a design guide. Over confidence that would replace design professional expertise. Too many changes on the BAS system, as an example.
  - Management protocols on controls should be included.
- Allen Doyle assessment tool – works as a commissioning of people. The format is currently a series of google questionnaires.
- Idea that if all services are outsourced, the system can't be fancy / sophisticated. Integrated systems and departments can have more automation.
- Allen Doyle – 'optimizing the people' to allow for building performance.
  - Researchers
  - Finance
  - Safety
  - Operations
  - Maintenance
  - Design

- It's a tool that scores individuals and departments, rated 1-5. Links training, operational abilities, building operations cost.
- AEI Sustainability Meter plan developed with Power BI – how that interface and graphic display could be used for our info.

## JUNE / **Complete mission statement**

1. June 16 –
  1. Brainstorm Goals list
2. June 30 – Organize Ideas
  1. Abbreviated mission statement

## 2. JULY / **Complete format**

1. July 14 – Brainstorm
  1. What does the rest of the year look like?
  2. How do we want to work?
2. July 28 – Organize Ideas

## 3. AUG / **Complete action plan - 2 years, 5 years, 10 years, beyond**

1. Aug 11 – Brainstorm
  1. Year 1 – Basic model. Beta Version.
  2. Year 2 – Pilot project of the user manual.
  3. Year 2 – Work on additional modules. Version 2.0.
2. Aug 25 – Organize Ideas

## 4. SEPT / **Compile and present**

1. Sept 8 – Identify tasks per person
2. Sept 22 – Review Draft as a committee

## 5. OCT / **Conference Time!**

1. Oct 5 – 8
  1. Present an update to the conference.
  2. Survey others beyond the group for input?
2. Oct ~15
  1. Move into phase 1 of the action plan!

## **Organization of the Manual ? / Subcommittees?**

1. Laboratory Planning
2. Laboratory Equipment
3. Building Systems
4. Architectural Building Design
5. Policy / Reporting / Other Operational Programs

## 6. Software Interface / Maintenance

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