Item No. 9b supp
Meeting Date: June 12, 2018

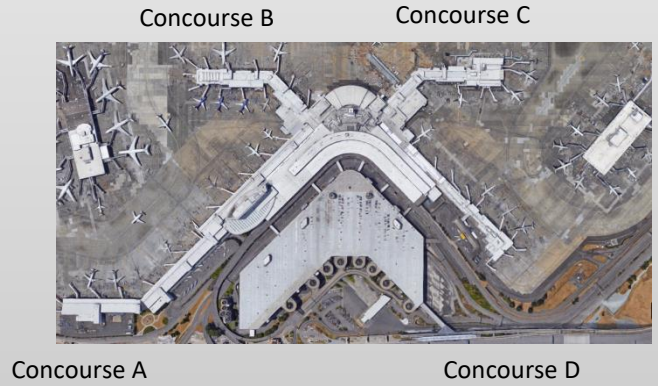
Main Terminal Low Voltage System Upgrade

C800061

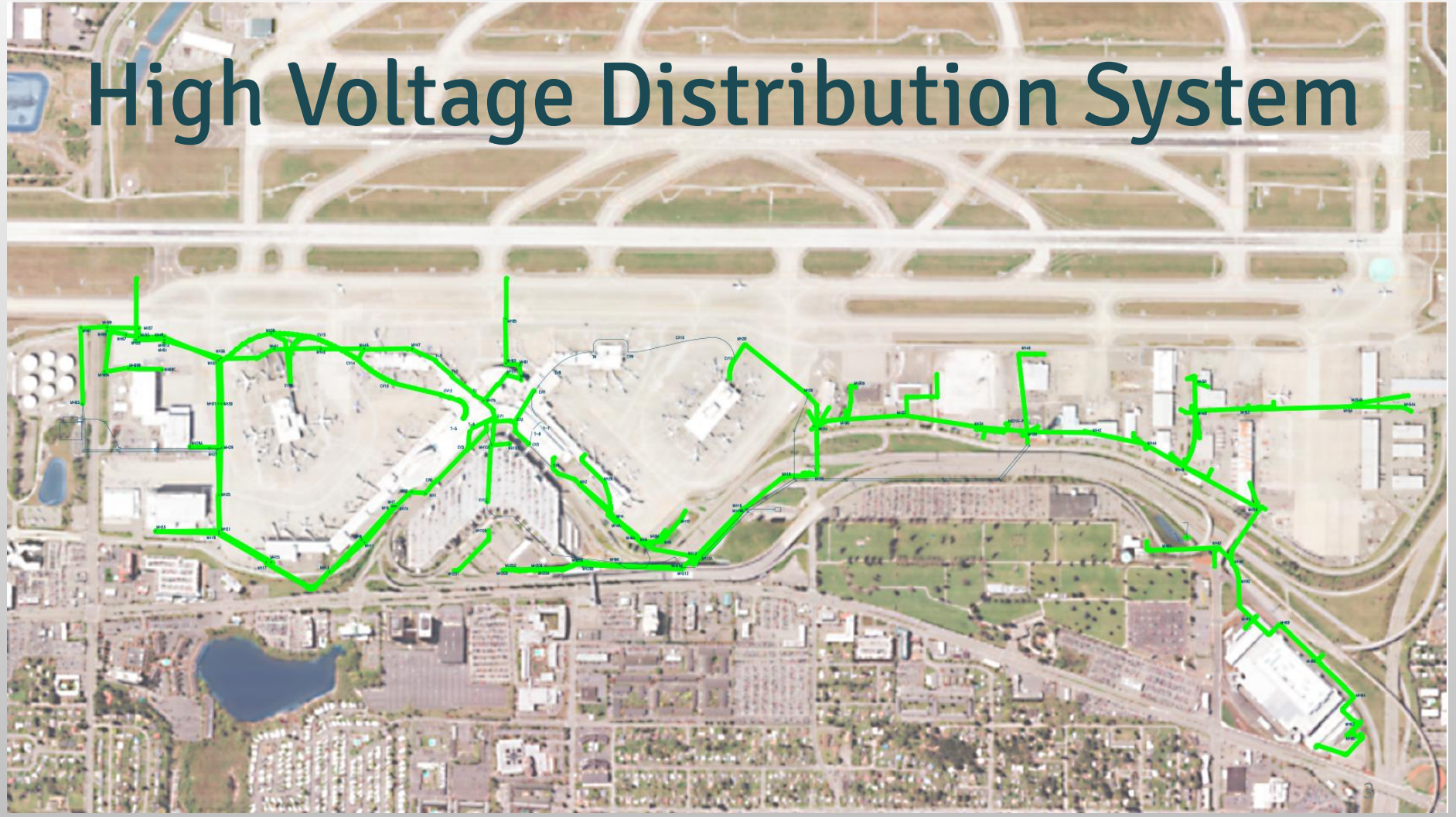
Port of Seattle®

Main Terminal Low Voltage System Upgrade

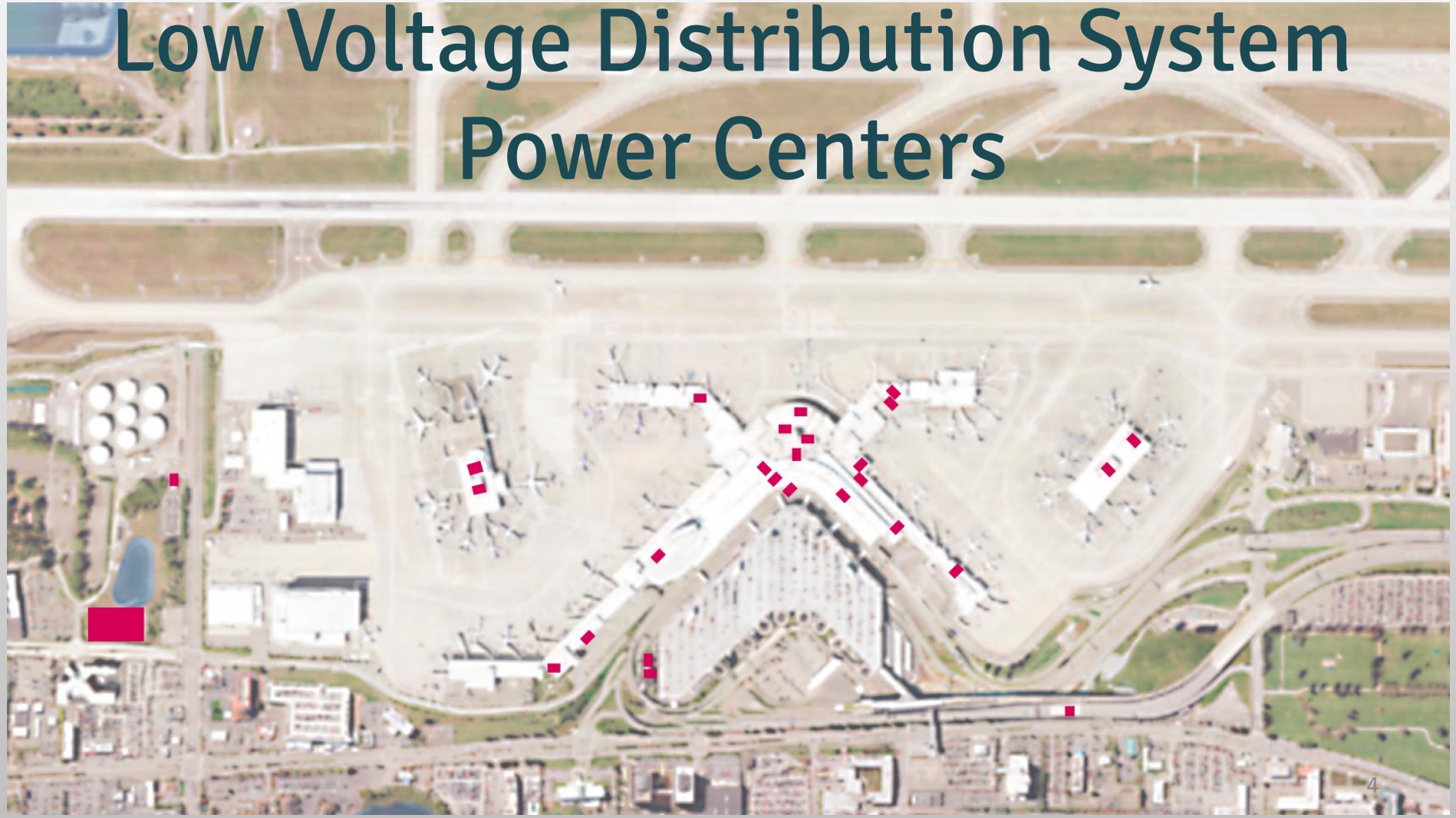
- What is the Main Terminal?
- What is Low Voltage?
- What is being Upgraded?



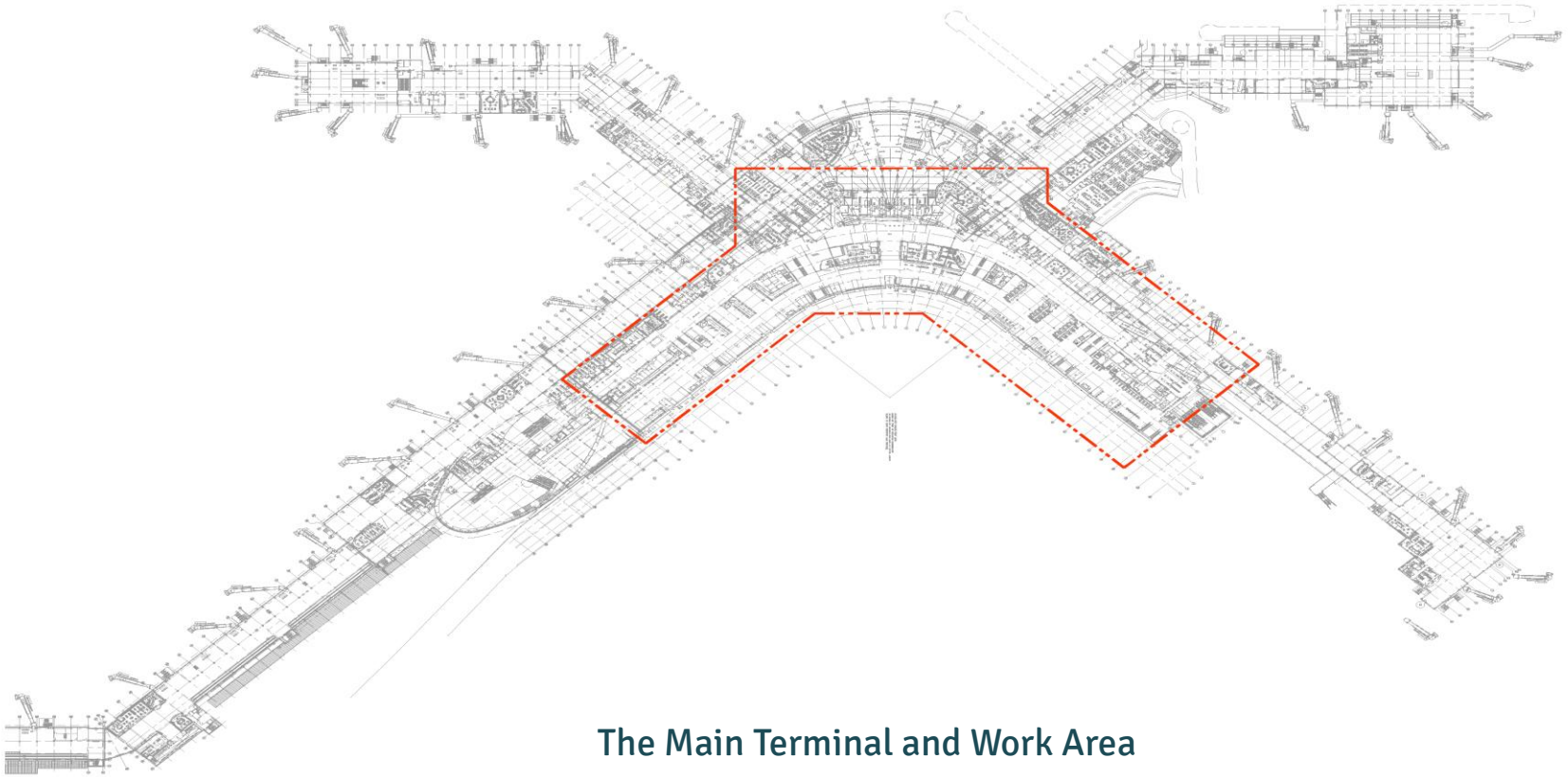
High Voltage Distribution System



Low Voltage Distribution System Power Centers



STIA Main Terminal



The Main Terminal and Work Area

Passenger Experience Video

Passenger Experience

Justification for Project

- Genuine risk to airport/airline operations
  - Aged equipment, risk of failure/fire (water damage), extended outages to repair
  - Loss of power to ticket counters and kiosks, baggage claim, communications, airline offices, elevators/escalators, HVAC.
- Existing system has limited capacity
  - Negates new equipment/circuits or increased loads
- Unsafe working conditions – risk of injury or death
- Inability to meter/monitor power usage

Risks of Delay

Typical Main Terminal Electrical Room

28” FROM PANEL TO RAILING

MECHANICAL VALVES IN WORKING SPACE

DANGER! ASBESTOS!

Safety issues in typical old Main Terminal electrical space.

Typical Main Terminal Electrical Room

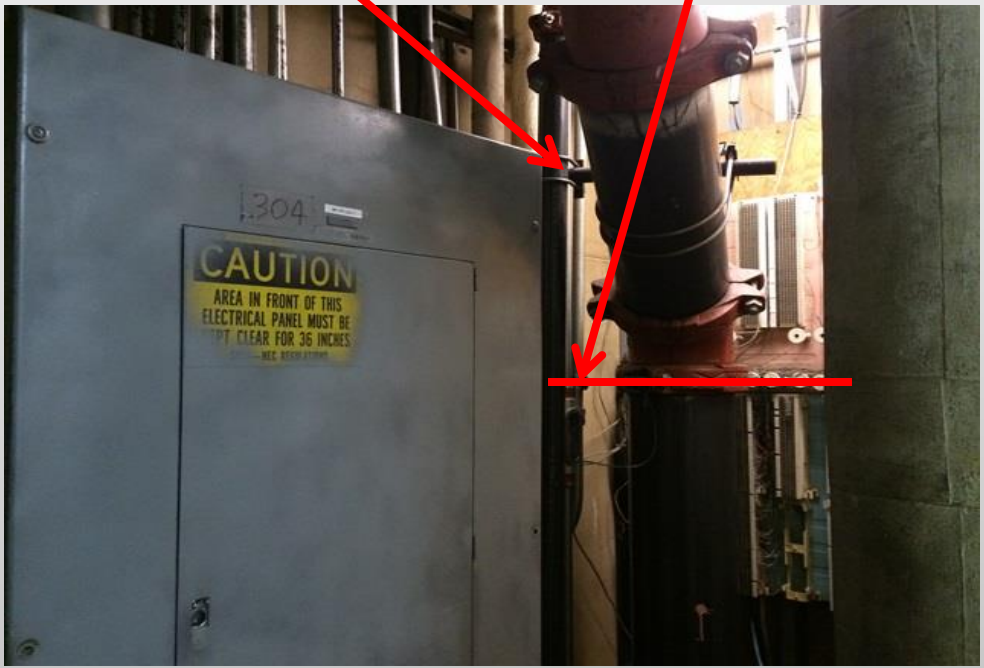
Safety issues in typical old Main Terminal electrical space with worker.

Another Electrical Room

18” CLEARANCE

6” CLEARANCE

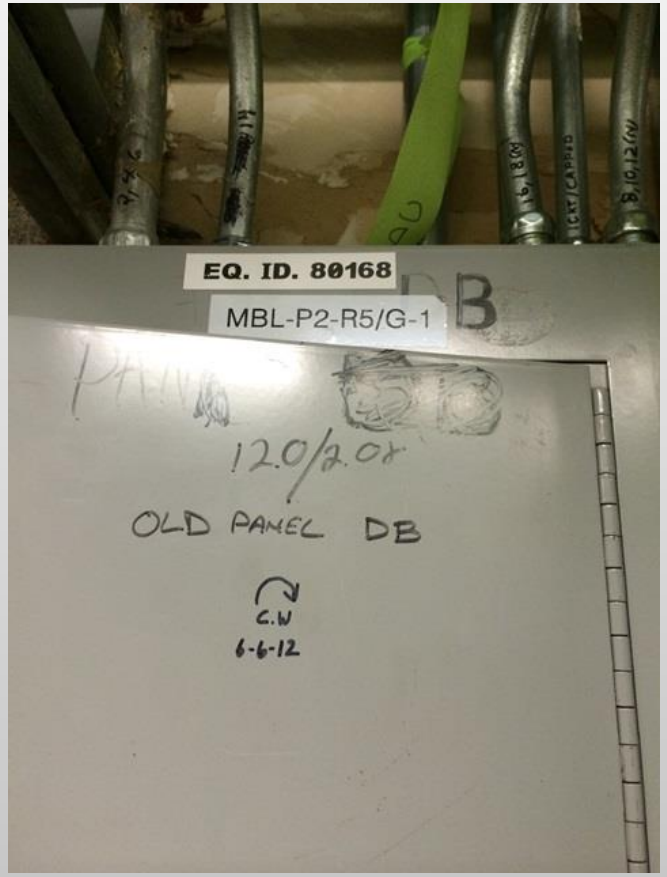
23” CLEARANCE



Working space does not comply with National Electrical Code.

Typical Power Panels in Main Terminal

- Manufacturer no longer in business.
- All breakers in use.
- Replacement circuit breakers not available.
- Unsafe condition.



Obsolete electrical panels.

Recent Power Outage in the News

A2 News | The Seattle Times | SATURDAY, APRIL 22, 2017

Nation & World Report

San Francisco power outage traps people in elevators

CAUSED BY MASSIVE FAILURE OF BREAKER

No injuries; service now restored

By JANIE HAR
Associated Press

SAN FRANCISCO — A San Francisco power outage that stranded people in elevators and left tens of thousands of others in the dark Friday was caused by the massive failure of a circuit breaker that sparked a fire at a power substation, a utility company spokesman said.

Power had been restored to nearly all of the 90,000 customers that lost power in the Financial District and other areas of the city, Pacific Gas & Electric spokesman Barry Anderson said.

Amid the blackout, downtown streets became clogged as drivers stewed and honked at each other. More than 100 parking-control officers and police officers were deployed to control the flow through intersections as about 300 traffic lights — about a quarter of those across the city — went dark.

As the evening commute began at 4 p.m., there was good news: Power had been restored to all but about 3,000 customers. An hour later, everyone had power.

The Fire Department tweeted that it had responded to more than 100 calls for service, including 20 stuck elevators with people inside. At hospitals, surgeries were disrupted briefly but no problems were reported because backup generators kicked in, Mayor Ed Lee said.

"The best news of all was no injuries were associated with this incident," Fire Chief Joanne Hayes-White said.

No traffic collisions were reported, and officials thanked motorists for driving so cautiously during the blackout. Indeed, in the city of 850,000, people were generally courteous to each other.

The city's cable cars were taken out of service for hours as a precaution.

The outage initially closed the Bay Area Rapid Transit agency's downtown Montgomery Station. People used the lights of their cellphones to walk through the darkened station before service was restored.

Later, people milled on sidewalks, controllers directed traffic manually, and shops were dark. Some buildings had power, others did not; and ATM screens were blank.

People were confused about what was going on and what to do, said Pam Martinez, 25, a software engineer who was on a train when she heard the announcement that her destination station was closed.

"Even crossing the street was chaotic because the streetlights don't work and there's a few ambulances trying to go through the crowds," Martinez said.

Patricio Herrera sat glumly in his darkened restaurant, Ziggy's Burgers, at what should have been a busy lunch hour full of people hungry for his hamburgers.

"We have lost everything today," said Herrera, the store's consulting chef and manager.

Employees at a Starbucks gave away cups of iced and hot coffee in the darkened shop. A worker said that was better than letting the coffee go to waste.

Anderson, the utility spokesman, said the substation that failed was set to be part of $100 million upgrade of the power system. "It just is the case where the equipment failed before we could get to it," he said.

Material from the San Francisco Chronicle is included in this report.

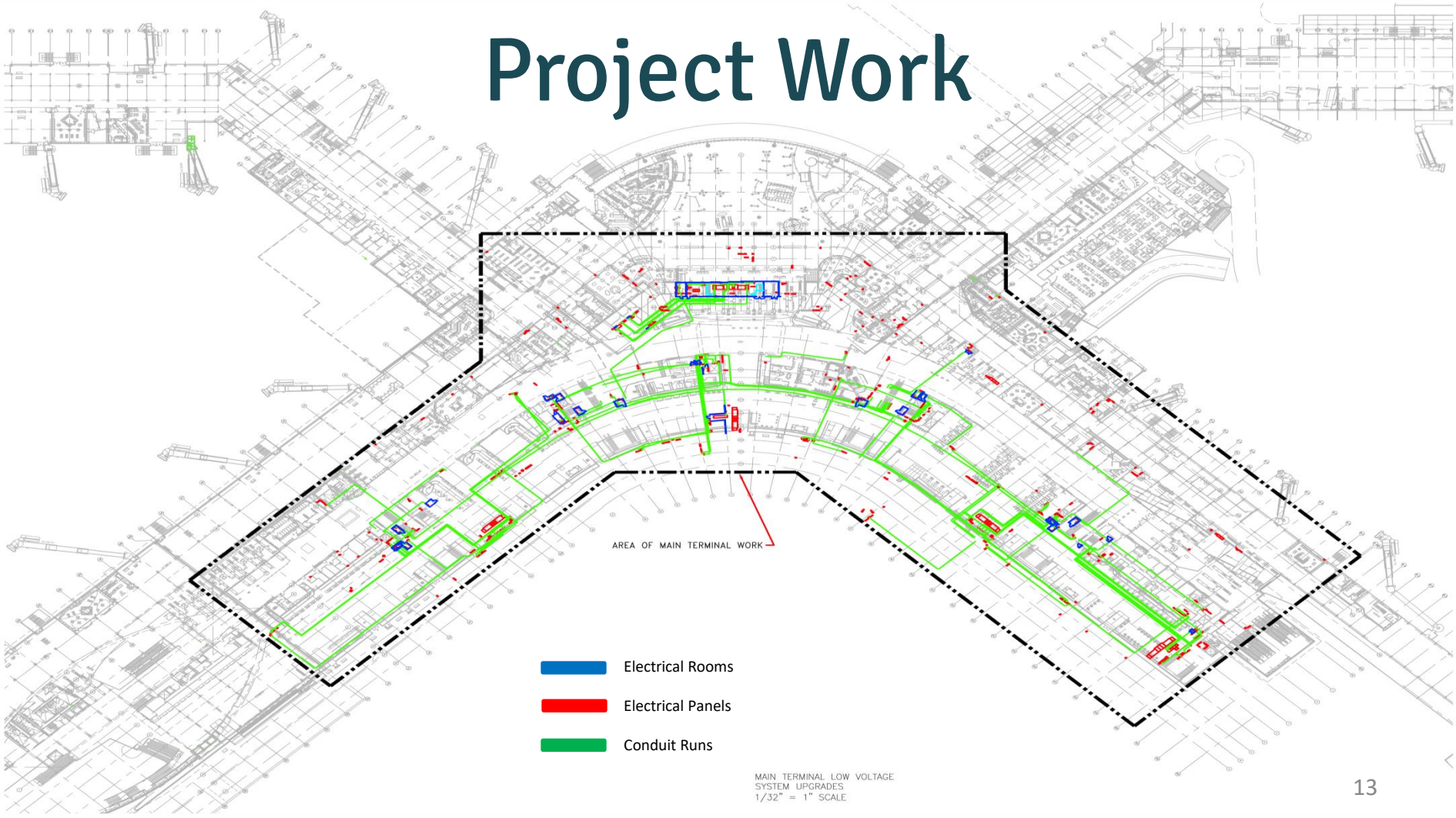
JEFF CHIU / AP

Hannah Wagner, marketing and food director of Bamboo Asia restaurant, works Friday during a power outage in San Francisco.

- Aging equipment was scheduled for replacement.
- "Equipment failed before we could get to it."

Failure of Aging Electrical Equipment Results in Power Outage

Project Work



Overview Budget

- Est. Final Construction Costs: $70,546,000
- Est. Design Costs: $29,754,000
- Est. Program Total: $100,300,000

Estimated Program Total: $100,300,000

Scope Item Costs

Scope Item	2014 Estimate	2018 Estimate
Normal Power	$20 Million	$61 Million
Emergency Power	$0	$5 Million
Central Power Center	$0	$14 Million
Branch Metering	$0	$7 Million
Regulated Materials Abatement	$0	$13 Million

Scope item cost by line item.

Overview Schedule

- Commission Authorization for Design: Q3 2018
- Design Team and GCCM Begin: Q1 2019
- Design Complete: Q4 2021
- Commission Authorization for Construction: Q3 2021
- Construction Start: Q4 2021
- Construction Complete: Q1 2025

Construction Complete 2024

Questions?