



Contra Costa Community College District

Districtwide Facilities Readiness (HVAC Assessments) In-Person Return Preparations - Fall 2021

District Office Update

May, 2021

Meeting Overview

- Introductions
- The HVAC Assessment Process and Outcomes:
 - Layered Strategy Approach: The Swiss Cheese Model
 - The Role of HVAC in Covid-19 Risk Mitigation
 - HVAC System Recommendations
 - Assessments Overview
 - Communication: the use of dashboards and checklists
 - Questions & Answers:
 - Please post your questions in chat to ensure we can answer as many as possible
 - This presentation and a FAQ sheet will be posted on District Covid-19 Resource website:
<https://www.4cd.edu/covid19/index.html>

Introductions

Taylor Engineering LLP (Alameda)

Taylor Engineering is a nationally recognized engineering firm specializing in mechanical systems design and construction, energy conservation, indoor air quality, controls, and system commissioning.

www.taylorengineers.com

www.taylorengineers.com/taylor-engineering-covid-19-whitepaper

Team members:

Hwakong Cheng, P.E., Principal – Project Lead

Steve Taylor, P.E., FASHRAE, Principal and Founder – Subject Matter Expert

Introductions

TRC:

TRC is a national engineering firm with a 40 year presence in the Bay Area. Experts in behind the meter systems and energy efficiency. <https://www.trccompanies.com/>

Team members:

Colman Snaith, PE, QCxP, CMVP – Director of Engineering

Leads a team of engineers specializing in understanding how buildings use energy, identifying efficiency opportunities, and verifying actual operations through metering.

Paul David, PE, CRM, CEPP, LEED AP – VP of Engineering

Responsible for TRC's Advanced Energy national engineering practice.

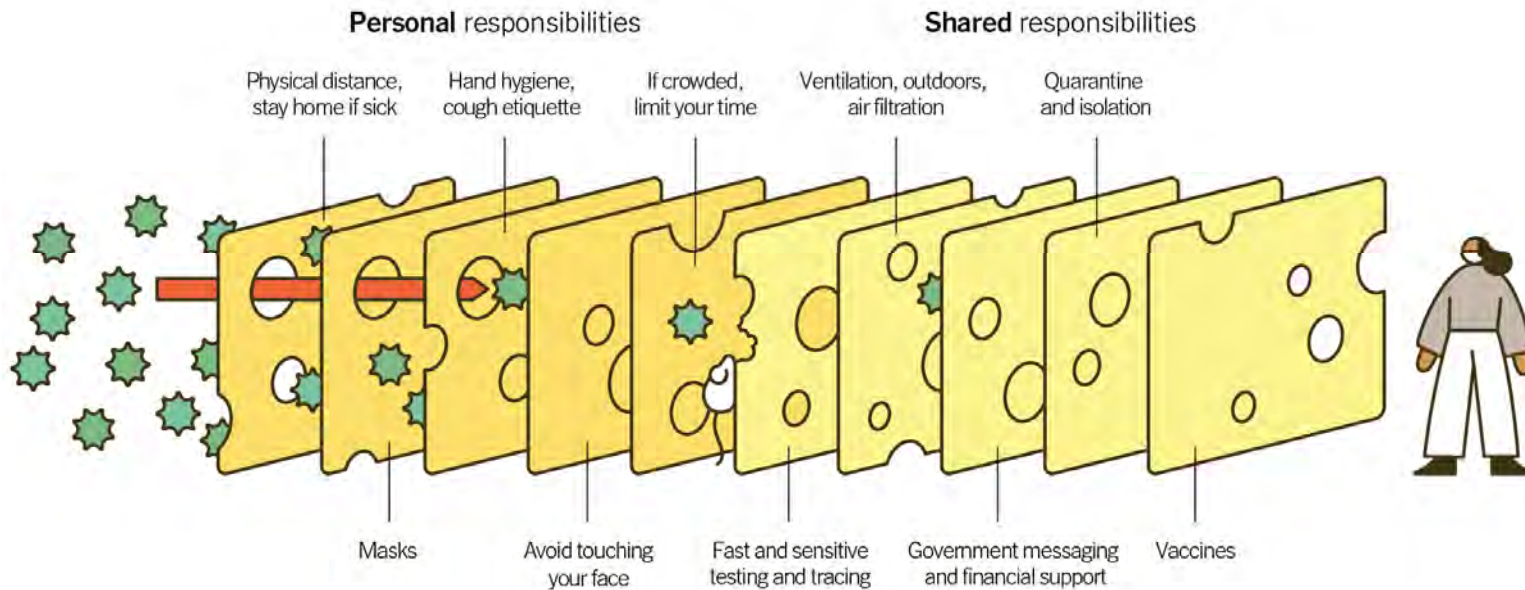
Gwelen Paliaga, PE, LEED AP – Director of Research and Technology Commercialization

Leads cross-discipline research and consulting that combines engineering, building science, and human factors to advance building technologies. Appointed to the ASHRAE Standards committee responsible for overseeing all ASHRAE Standard.

The Swiss Cheese Model of Pandemic Defense

Multiple Layers Improve Success

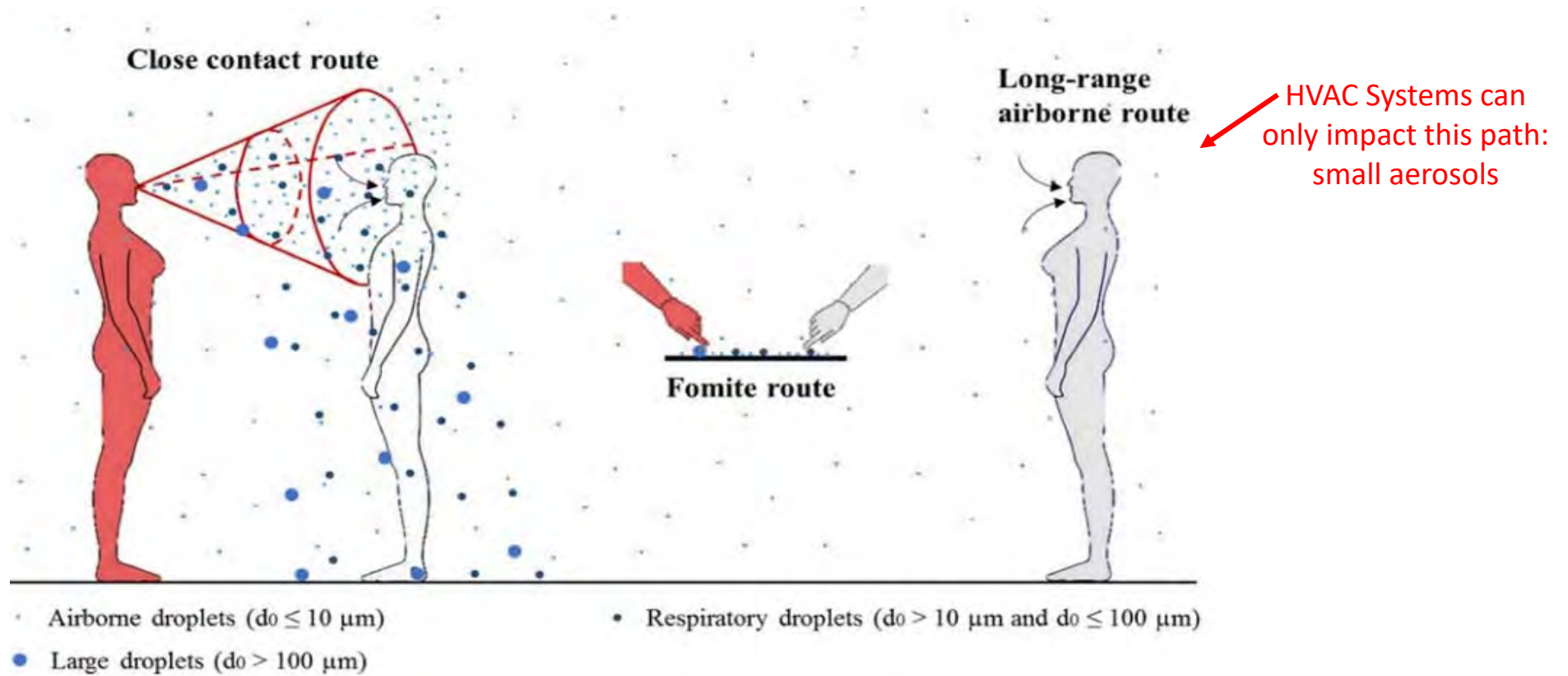
The Swiss Cheese Respiratory Pandemic Defense recognizes that no single intervention is perfect at preventing the spread of the coronavirus. Each intervention (layer) has holes.



Recognizing that no single intervention is perfect at preventing spread. Yet, *collection of safeguards can achieve the desired level of protection.*

Source: Adapted from Ian M. Mackay (virologydownunder.com) and James T. Reason. Illustration by Rose Wong

How is COVID-19 transmitted?



The Role of HVAC in Covid-19 Risk Mitigation



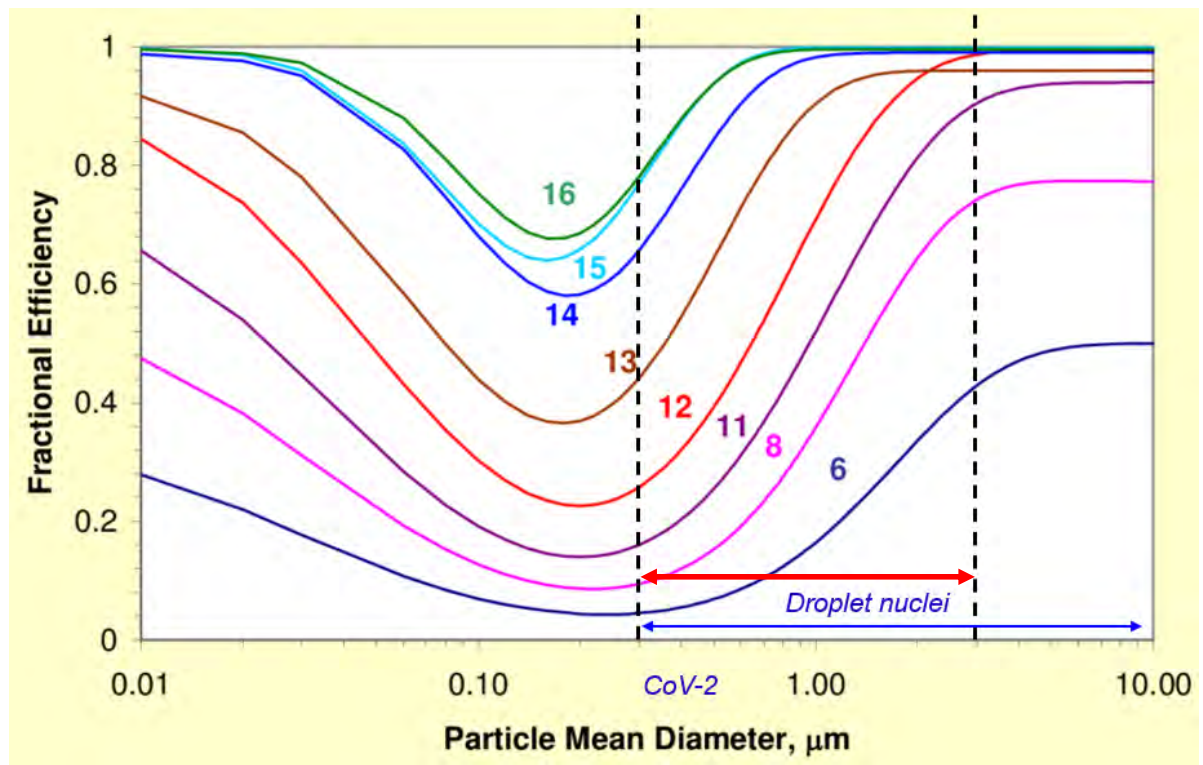
Masks are needed to mitigate near-field transmission. No amount of ventilation can help.

Masks are also needed to reduce the source strength of aerosol generation. The amount of ventilation needed otherwise would be impractical.

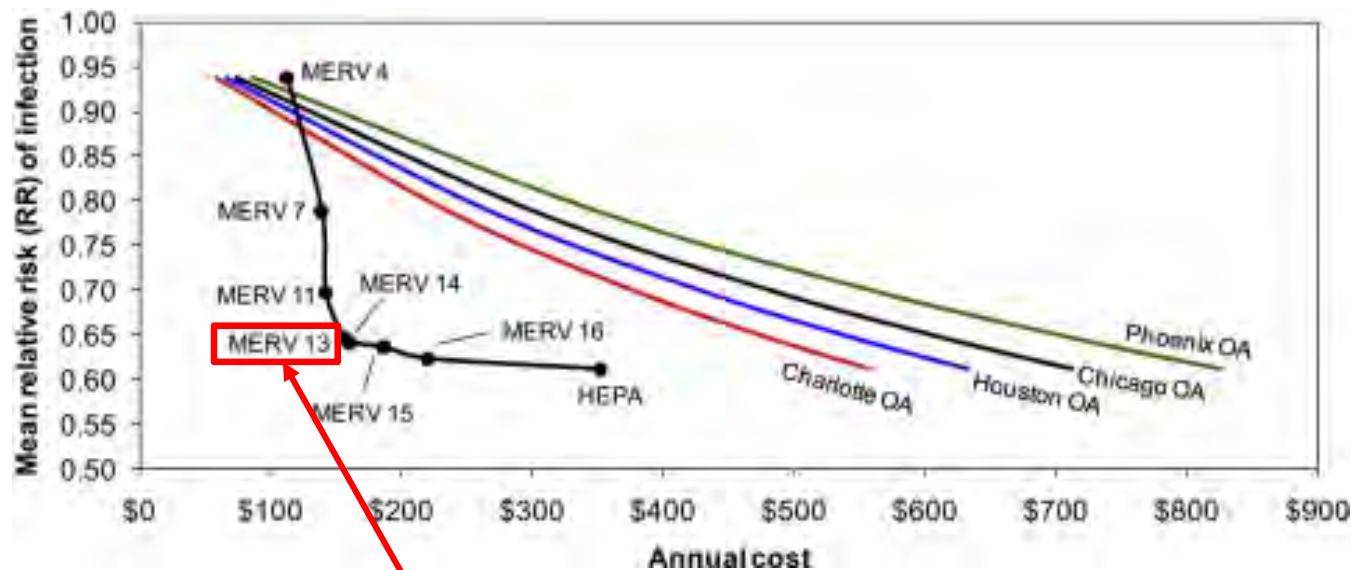
Filtration or outdoor air?



Minimum Efficiency Reporting Value (MERV)



Filtration or outdoor air?



ASHRAE Recommendation (also LEED credit and Title 24 requirement for new buildings)

HVAC System Recommendations

Ventilation:

- Minimum required ventilation rates per applicable codes and standards (California Title 24)
- HVAC outdoor air controls are working (+ extra outdoor air when feasible)
- Start systems at least 1 hour before occupancy and at least 1 hour after.

Air Filtration:

- Confirm / improve filtration to MERV 13+

Assessments

	Ventilation						Filter Rating
Status	Ventilation Airflow	Economizer Function	DCV	Adjust Economizer	EF Operation	Total	
Pass							
Issue							
Incomplete							

Recommendations

	Ventilation						Ceiling Fan	Filter	Other
Campus	Repair Econo	Re-balance OA	Econo Prog / Setpt	DCV / Occ	Portable HEPA	EF			
All									
Contractor 1									
Contractor 2									
M&O Staff									

Overview of the Assessment

Field assessments will reveal current conditions and where modifications are need.

TRC is in the process of assessing all of the HVAC systems serving all of buildings at every campus:

- 6 sites
- 129 buildings
- 2,812 rooms
- 1.7 million square foot of space

A team of 8 engineers focused on helping 4CD complete these HVAC assessment

Collaborating with campus Maintenance and Operations staff to gain access and complete the assessments.

Campus	Buildings	Total Systems	Priority Systems	Already Surveyed
DVC	60	211	131	84
LMC	29	98	55	41
CCC	35	96	46	0
BEC	1	21	18	4
SRC	2	12	11	0
4CD	2	2	0	0
Total	129	440	261	129

Overview of the Assessment Approach

TRC is focused on:

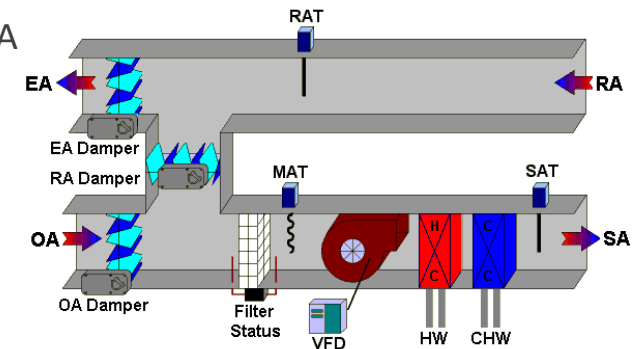
- Assessing the condition and functionality of the units
- Measuring the total outside air provided to the building (ventilation)
- Collecting information to support calculating the total amount of clean air delivered to the building (filtered)

Measurements include outside air (OA) and supply air (SA):

- High ventilation air conditions – full supply air flow & maximum OA
- Intermediate ventilation air conditions – full supply air flow & minimum OA
- Low ventilation air conditions – minimum supply air flow & minimum OA

Standard approach with variations based on actual conditions:

- Different types of air handling units
- Different layouts
- Different control strategies



Communication: Dashboards and Checklists

Select your school: ACORN Woodland Elementary

Filter school list by: Region (All), Level (All), Network (All)

This dashboard shows the readiness level for the safety and facility measures across all districtwide programs including Early Childhood, TK-12, and Young Adult. You can view the school-specific measures on the left, view the corresponding results for the entire district on the right, and view more general districtwide readiness measures on the bottom.

ACORN Woodland Elementary Deep East - Elementary - Network 3
Data as of April 28, 2021. Date of last safety walk-through: 3/4/2021. Date of last air filter installation: not yet installed

Category	Measure	Status
Active campuses	In-person programs	Indoor Hybrid
Custodial	Deep cleaning of all classrooms, restroom soap dispensers filled & repaired	Complete
	Electrostatic sprayer on site for sanitizing high touch surfaces	Complete
	New custodial COVID cleaning protocols and procedures posted in Main Office	Complete
	Tracking systems to ensure all sites are regularly cleaned and stocked with hand sanitizer, soap, paper towels	Complete
PPE	PPE inventory on site (incl surgical masks, face shields, plexiglass, hand sanitizer)	Complete
Facility readiness	Classrooms set up for social distancing standards & reduced occupancy	Complete
	Hand sanitizers located at entrances	Complete
	HEPA air purifiers on site (2 per teacher + 4 for shared spaces)	Complete - 32 on site
	HEPA air purifiers placed in classrooms and shared spaces	Complete
	Isolation space identified & set up	Complete
	Required Alameda County safety practices signs posted at Main Entrance	Complete
	Safety signs placed (social-distancing, mask-wearing, hand-washing, one-way hallway traffic)	Complete

Districtwide Summary Results
Data as of April 28, 2021

Category	Measure	Value
Active campuses	In-person programs	110
Custodial	Deep cleaning of all classrooms, restroom soap dispensers filled & repaired	100%
	Electrostatic sprayer on site for sanitizing high touch surfaces	100%
	New custodial COVID cleaning protocols and procedures posted in Main Office	100%
	Tracking systems to ensure all sites are regularly cleaned and stocked with hand sanitizer, soap, paper towels	100%
PPE	PPE inventory on site (incl surgical masks, face shields, plexiglass, hand sanitizer)	96%
Facility Readiness	Classrooms set up for social distancing standards & reduced occupancy	92%
	Hand sanitizers located at entrances	98%
	HEPA air purifiers on site (2 per teacher + 4 for shared spaces)	1812 distributed
	HEPA air purifiers placed in classrooms and shared spaces	83%
	Isolation space identified & set up	80%
	Required Alameda County safety practices signs posted at Main Entrance	96%
Safety signs placed (social-distancing, mask-wearing, hand-washing, one-way hallway traffic)	95%	

Next Steps...

HVAC Assessments Plan Development

- Baseline data collection process – complete
- Framework for analysis and recommendations – complete

Field Assessments

- Target completion of priority buildings in May – 90% complete; Remainder of buildings in June; follow up with M&O teams is in progress

Analysis and Review of Assessment Outcomes

- Reconcile the intended use based on in-person plans & HVAC assessment outcomes;
- Priority buildings – May; remainder of buildings in June/July

Recommended Measures Implementation

- Priority buildings: now – summer; remainder of buildings August/September
- We are competing with other districts + private orgs.; our speed is influenced by that

Optimize Source Control, Ongoing Education & Information Sharing

- Building on already great work that's been completed; Importance of partnership & following CDC and OSHA public health guidance.

Active Communication

- Actively communicate throughout the process; utilization of existing districtwide meetings for updates
- Progress dashboard and checklists: target June/July for dashboard implementation

Team Contacts:

Hwakong Cheng, P.E., Principal – Project Lead

hcheng@taylor-engineering.com

Steve Taylor, P.E., FASHRAE, Principal and Founder

staylor@taylor-engineering.com

Taylor Engineering White Paper (reference)

<https://taylorengeers.com/taylor-engineering-covid-19-whitepaper>

Colman Snaith, PE, QCxP, CMVP – Assessments Lead, Director of Engineering, TRC

CSnaith@trccompanies.com

Tracy Marcial, P.E., Energy & Sustainability Manager tmarcial@4cd.edu

Ines Zildzic, VC Facilities Planning & Construction izildzic@4cd.edu

Thank you for your time!
Questions/Comments
