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UC Berkeley San Francisco Ergonomics Program

The California Janitor Workload Study
Determining safe and effective workloads for California Janitors during the COVID-19 era.

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Study Phases

Survey

- COVID-19 impact
- Exposures
- Mental/Physical Health

Focus Groups

- Work changes
- Productivity Requirements
- Management challenges

Time Motion Study

- Biomechanical exposures/risk
- Compare actual to ISSE production rates

Survey- Research Questions

1) **Determine the types of COVID-19 prevention measures implemented at janitorial workplaces**.

2) **Compare workloads pre and with pandemic**

3) Describe the relationship between janitor workload, work climate, prevention measures, organizational policies and health (mental and physical)

Survey Methods

- Piloted survey by email, noticed challenges with:
  - response rates
  - survey completion
- Provided optional one-on-one interviewing
- Continue collecting survey data
  - by email
  - interviews at data collection sites

Demographics

715 respondents

- 74% Female
- 96% Hispanic
- 61% care for others living with them
- Education
  - 35% some or no high school
  - 49% GED or equivalent
  - 15% some college

Age (years)	%
18-29	3%
30-49	42%
50-65	48%
>65	7%

Work Experience

Years Worked

- 12.3 (SD=8.8) average years worked as a janitor
- 7.8 (SD=7.1) average years at current employer
- 82% have worked for 1-3 companies as a Janitor

Work Shift

- 41% day shift, 46% work night shift, 10% swing

Second Job

- 25% work a second job
- Average of 21 hours (SD=13) per week

Union Representation

- 48% represented by a Union
- 16% non-unionized

Venue Type

Venue	N=715	%
Office	536	75%
Schools	33	5%
Airport	28	4%
Events/Convention	17	3%
Malls/shopping centers	27	4%
Tech/biotech	16	2%
Other	58	9%

Workload- Tasks Performed >2hrs/Day

	% Workers	Rate of Perceived Exertion (0-10)
Sweeping/mopping	32%	6.9 (2.6)
Vacuuming	27%	6.9 (2.7)
Trash collection/sorting	33%	6.6 (2.7)
Cleaning kitchens	15%	5.9 (2.9)
Cleaning bathrooms	35%	7.0 (2.6)
Dusting	30%	5.7 (2.7)
COVID 19 disinfection	21%	6.1(2.9)

Workload- Activities Performed >2hrs/Day

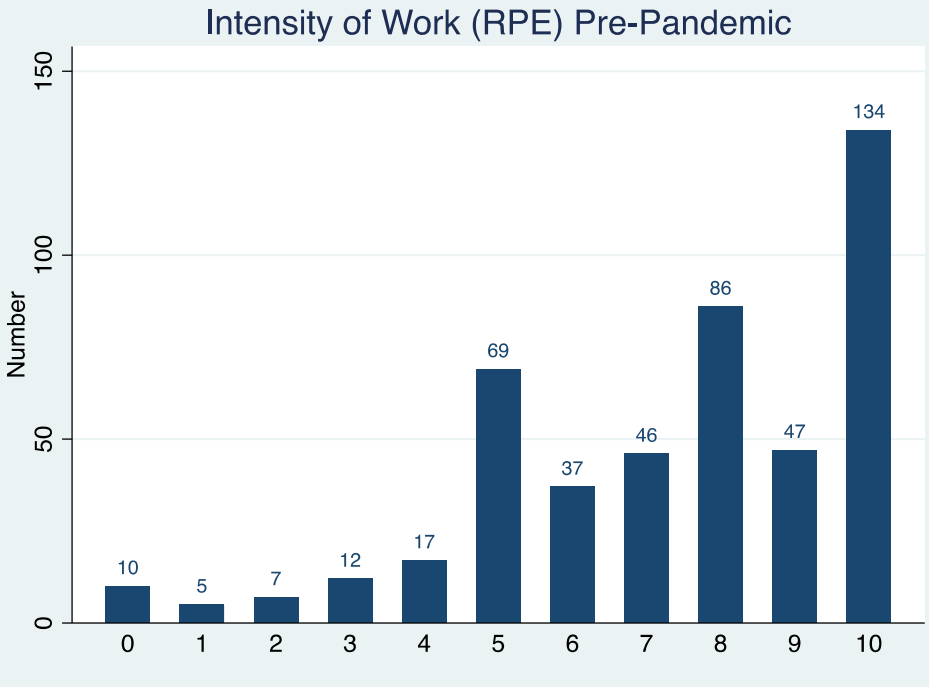
(N=426)	All/Most Days	Some Days	Never or Almost Never
Repetitive motion with hands, wrists, arms or shoulders	**80%**	10%	9%
Neck or back bent without support	**48%**	22%	29%
Lift or lower objects above the shoulders or below the knees or while twisting	**47%**	22%	32%
Work with hands overhead	**45%**	27%	28%

Workload comparison NOW versus BEFORE COVID

(N=451)	**Agree**	**Disagree**	**Not applicable**
Workload has **INCREASED**	50%	30%	19%
Required to do **ADDITIONAL** disinfecting tasks	50%	26%	23%
Pressured to work **FASTER** and do **MORE**	43%	33%	24%

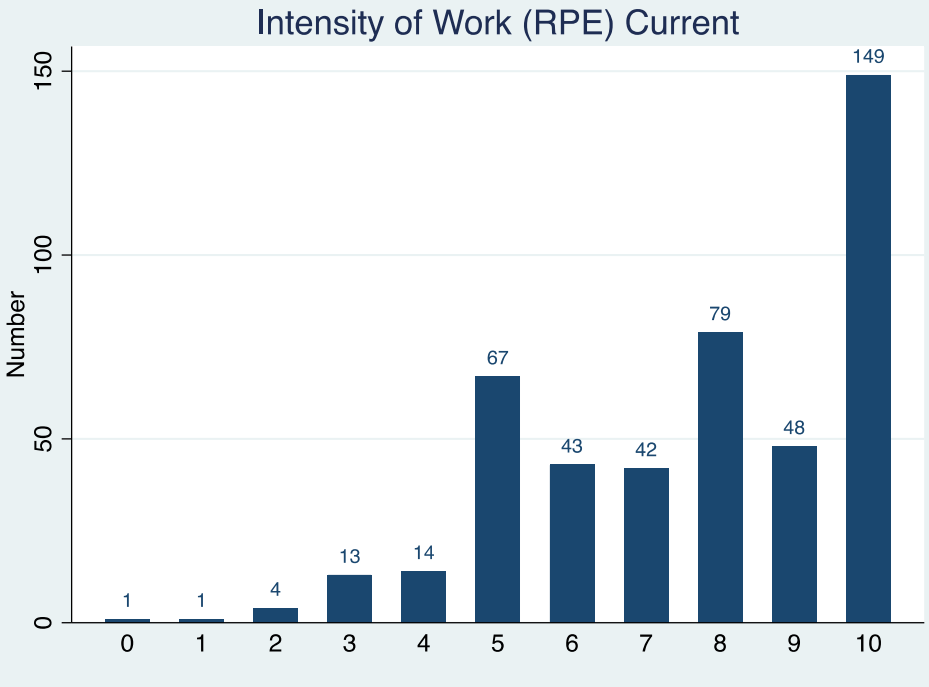
Intensity of Work (RPE)

N=470



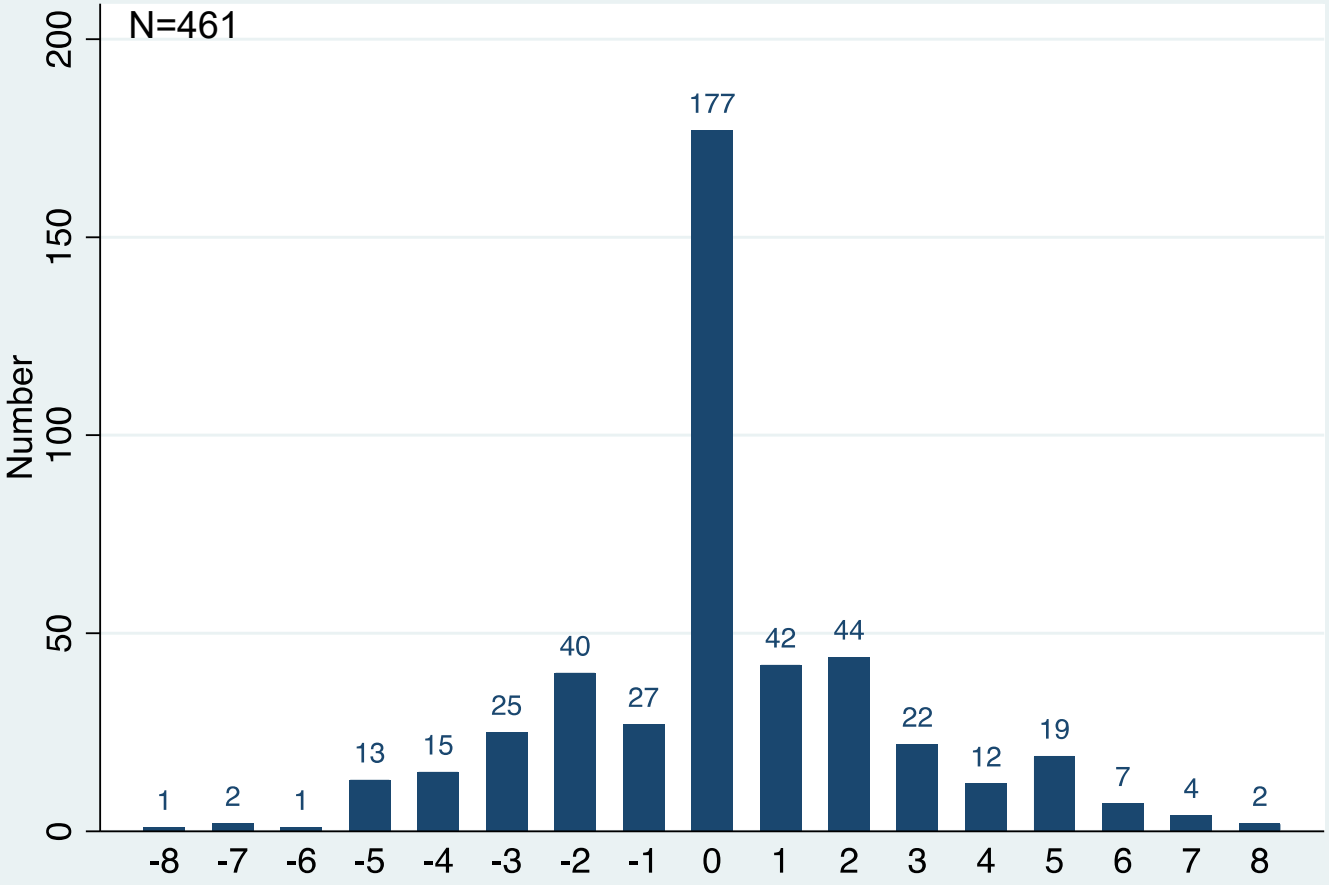
Mean=7.4 (SD=2.5)

N=461

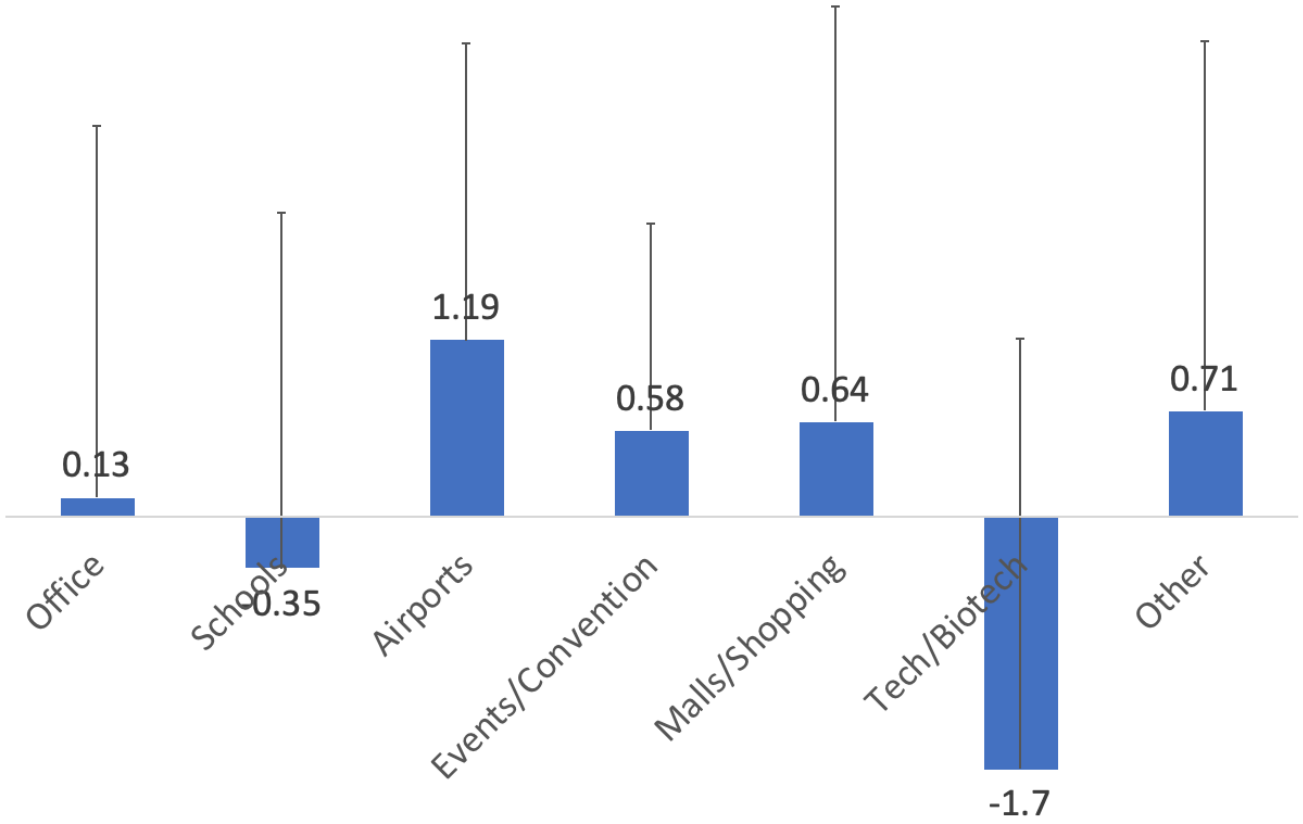


Mean=7.7 (SD=2.2)

Change in Intensity of Work (RPE)



Change in Intensity of Work by Venue Type



COVID -19 Experience

- 5% unvaccinated (n=11)
- 26% unsure who to go to if they get injured or sick

	AGREE	DISAGREE
Can stay home with symptoms and not fear job loss or less pay.	67%	**33%**
Increased risks of getting sick because of my work	**79%**	21%
My employer will notify me if someone gets sick.	53%	**47%**
My employer provides me with supplies to protect myself	68%	**33%**
I have the time I need to use protective measures.	76%	**25%**

Prevention Measures- Training

22% never received any prevention training
17% could not understand it due to language barriers

(N=195)	
Online Training	23%
In-Person Group Training (ie., morning meeting)	31%
In-Person Individual Training	7%
Information was posted	11%
An email or letter was received	7%
No information or training has been provided	22%

Prevention Measures- PPE

77% provided PPE most or all the time

During past week (N=202)	Never	Some of the time	Most or All of the Time
Wear a face mask?	**56%**	10%	35%
Wear a respirator?	**34%**	2%	64%
Wear a bandanna over your nose and mouth?	**34%**	6%	59%
Wear gloves?	**66%**	6%	28%

22% only occasionally or never receive PPE

Time Motion Study

Venue 1 Mall	Data Collection in January 2023
Venue 2 Airport	Data Collection in progress
Venue 3 Event/Convention	Exploring Access
Venue 4 Office Buildings	Re-approaching buildings to determine if occupancy is up to 75%

Time Motion Study- Research Questions

1. What are the tasks, durations, and rates per venue, location, and area?

2. What are the durations, frequency and magnitudes of biomechanical exposures and risk for MSDs?

3. What is the physiological workload and risk for cardiovascular strain?

4. How does the actual work rate compare to the ISSE production rates and COVID-19 production rates?

Data Collection Equipment

Heart Rate Monitor(HR)

activPAL™

Handheld Camera

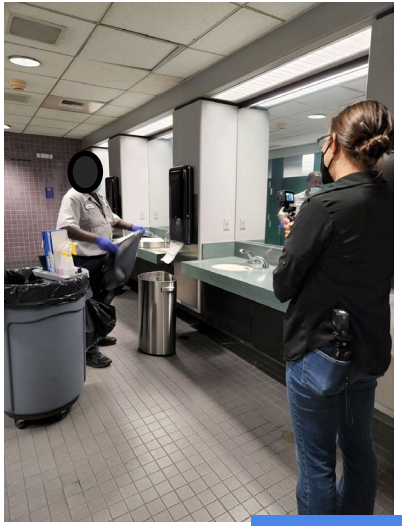
Laptop used with XSens & LMM only

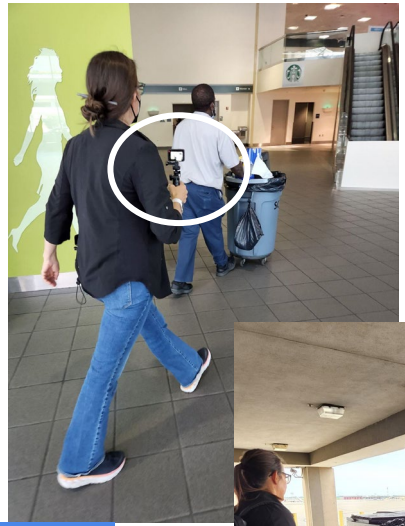
XSens

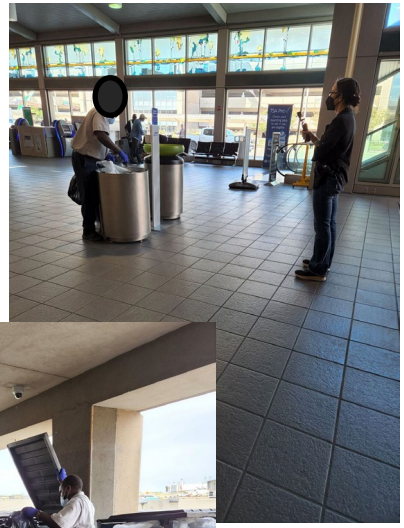
Lumbar Motion Monitor

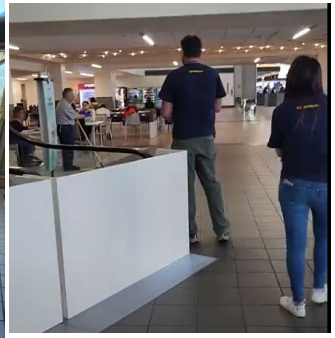
Data Collection in Motion

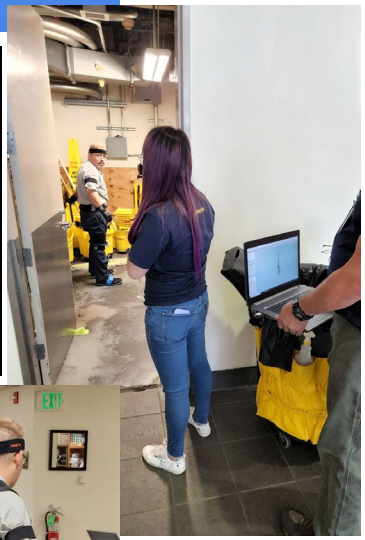
2 Researchers/ Worker









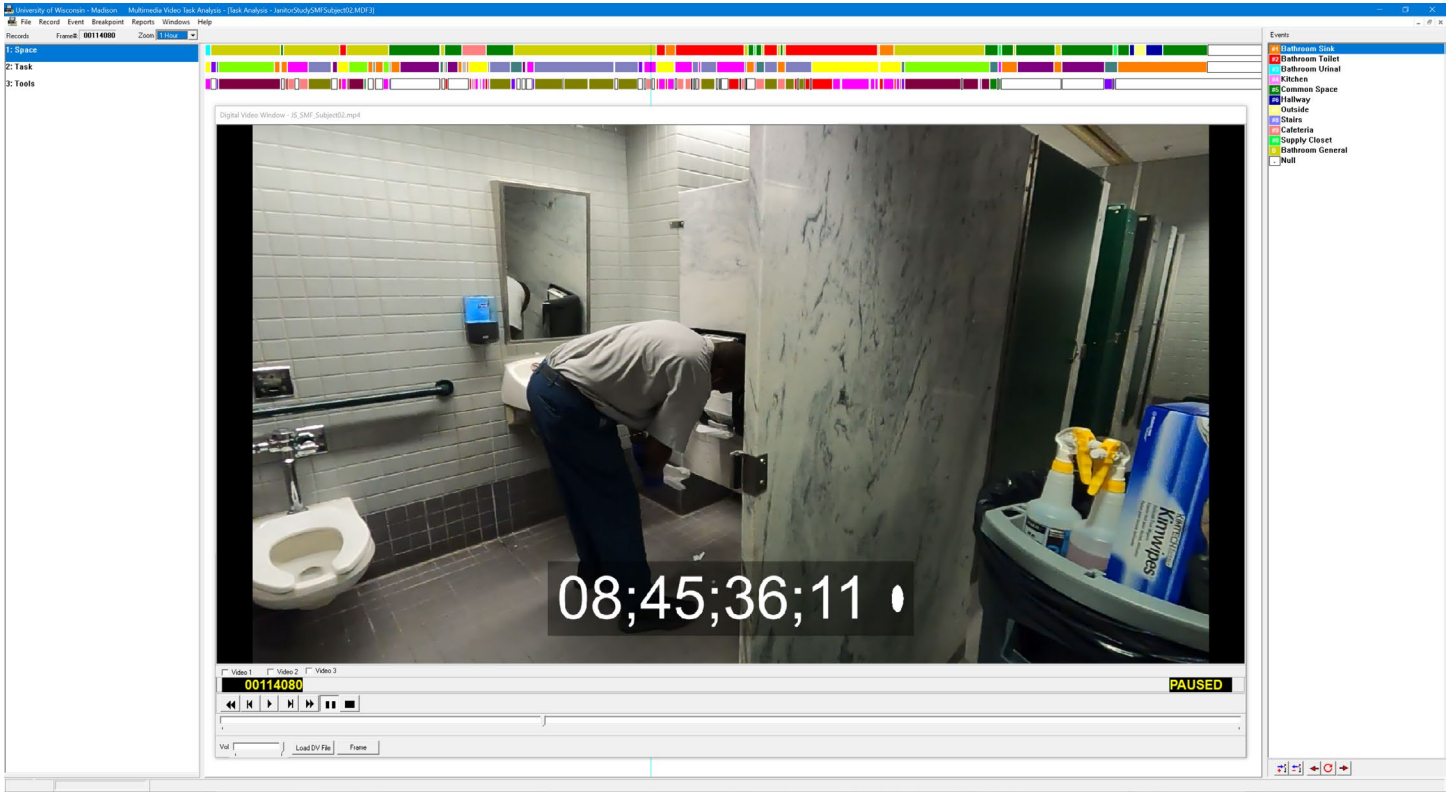


Handheld Camera

Measurements

Wearable Sensors

Detailed Video Analysis



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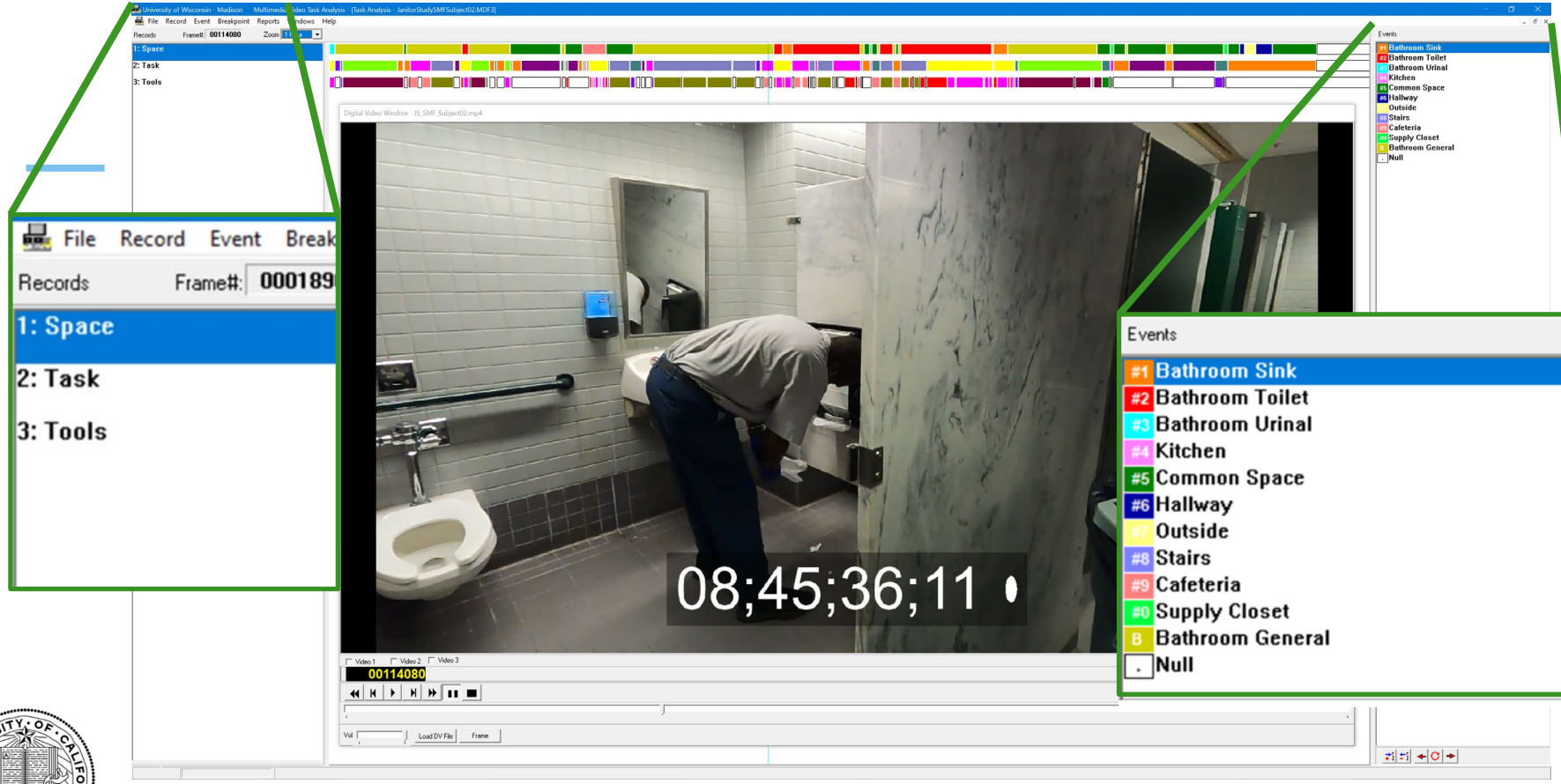
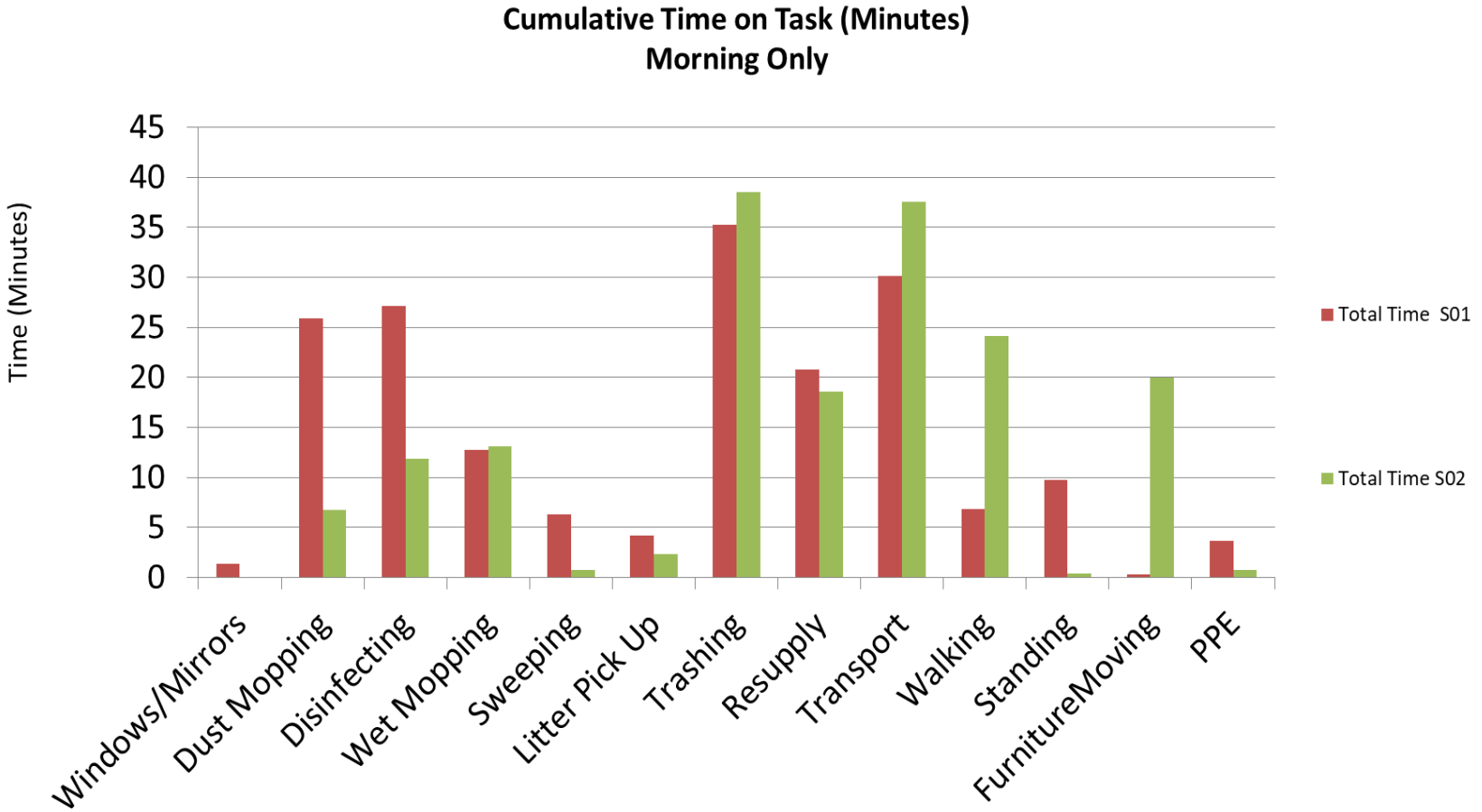

File Record Event Break
Records Frame#: 000189
1: Space
2: Task
3: Tools
08;45;36;11
Events
#1 Bathroom Sink
#2 Bathroom Toilet
#3 Bathroom Urinal
#4 Kitchen
#5 Common Space
#6 Hallway
#7 Outside
#8 Stairs
#9 Cafeteria
#0 Supply Closet
B Bathroom General
Null

22


Cumulative Time on Task (Minutes)
Morning Only
Time (Minutes)
45
40
35
30
25
20
15
10
5
0
Windows/Mirrors
Dust Mopping
Disinfecting
Wet Mopping
Sweeping
Litter Pick Up
Trashing
Resupply
Transport
Walking
Standing
FurnitureMoving
PPE
Total Time S01
Total Time S02

23

Assign Physical Demands & assess Risk

Examples Include:

- Average weight of items of interest (e.g., trashcan, full and empty)
- Grip and Pinch forces required to manipulate frequently used elements (e.g., spray bottle triggers, stretching trashbag onto rim)
- Push and Pull forces required to manipulate a variety of often engaged jobsite elements (e.g., furniture, cleaning carts, mops)
- Height and area of frequently cleaned surfaces to determine reach requirements

Challenges & Next Steps

Budget spending has been in line with work/ access to venues

- Will be able to bring on more people as access increases
- Will have carryforward to support ongoing analysis

Winter will be dedicated to:

- Continued data analysis of video on participants to date
- Collecting data on airports, malls, and offices
- Identifying 4th type of Venue

Challenges

- Access is very challenging
  - Property owner & janitorial service
- Participation with wearables is limited thus far

Questions?

THANK YOU!

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