
CASE STUDY: LOS ANGELES INTERNATIONAL AIRPORT (LAX) ZOONO MICROBE SHIELD SURFACE PROTECTANT

CHALLENGE

Travel hubs around the world are eager to uncover a superior solution for maintaining a heightened state of hygiene in their facilities to protect both employees and passengers and to increase consumer confidence that travel is safe in a post-COVID world.

In October 2020, Los Angeles World Airports (LAWA), the airport authority that owns and operates Los Angeles International Airport and Van Nuys Airport, requested that Zoono conduct a pilot program to assess the effectiveness of its antimicrobial barrier technology for potential use throughout its airport terminals and high traffic common areas.

In this trial, Zoono was seeking to confirm the superior result that can only be achieved with a technology like Zoono and quantify the opportunity of a significant reduction in the microbial load throughout the LAX facility. Zoono, in conjunction with LAX Operations Management, executed a Use Case to quantify the benefits of using a cleaning and maintenance regime that utilizes Zoono's surface protectant product, Zoono Microbe Shield.

THE ZOONO PRODUCT

The Zoono Microbe Shield is proven to be a long-lasting, largely non-toxic (LD50 similar to Vitamin C), water-based surface protectant. The product is currently sold in over forty countries globally with many high-profile customers as dedicated clients, including several international airports, such as Hong Kong and Dubai, and world-class airlines, such as United Airlines and Singapore Airlines. The product is distributed in the USA by New Jersey-based Zoono Holdings LLC, which is part of Zoono Group Limited, a public company based in New Zealand and traded on the Australian Stock Exchange.

TECHNOLOGY

Quaternary Ammonium Compounds (also referred to as QACs or "quats") have been recognized as having strong, long lasting bactericidal and antimicrobial properties. QACs have been used within hospital environments globally for several decades and many are approved by the Environmental Protection Agency as antimicrobial substances in the United States. Zoono offers a product that has materially improved on historical quat technologies and has a long global pedigree of effectiveness on a broad spectrum of pathogens, including bacteria, fungi, viruses, protozoa, and molds. The benefits of Zoono that made it an ideal product for this Use Case include:

- Long-lasting: effective up to 90 days on surfaces
- EPA registered: #83129-1-90830
- Ready to use: no mixing or measuring necessary, so no room for human error
- Low toxicity: LD50- similar to Vitamin C
- Water-based (vs. alcohol-based)
- Does not promote microbial mutation
- Non-staining / odorless
- Ease of use: trigger sprayer or fogger
- Non-flammable / safe to use
- Permanently bonds to surfaces
- Non-damaging and non-corrosive to surfaces
- Shelf-stable for 3 years

... and perhaps the most important differentiation is that **Zoono has quantitative data to support its efficacy from numerous internationally recognized laboratories**, along with registrations and approvals from major developed countries around the world, including Europe and Australasia.

HYPOTHESIS

The expected outcome of this test was that LAX surfaces treated with Zoono will remain at a higher state of hygiene (i.e. germ free) – as measured by an Adenosine Triphosphate (ATP) monitoring system – than comparable surfaces left untreated.

USE CASE OUTLINE

Zoono performed an ATP test protocol to establish a baseline measurement of the hygienic conditions of a representative sampling of common, high-touch surfaces. Following the collection of initial readings (Baseline), those surfaces were cleaned thoroughly. Half of the target areas were Test areas and treated with Zoono Microbe Shield weekly and the balance served as Control and were not treated with Zoono but were regularly cleaned using standard cleaning practices. Each week, first an ATP reading was taken at all Test and Control locations. After each reading was recorded, Zoono was applied to Test locations, but not Control areas.

ATP testing locations in both Test and Control environments were a variety of high-touch locations throughout the Terminal, such as handrails, tables, ticket kiosks and cash machines, assessed to be cleaned regularly by in-house maintenance crews. The Test locations were designed to be as comparable as possible to not introduce variability due to Test location selection. For example, an ATM on the left would serve as Test and be treated with Zoono weekly whereas its counterpart ATM on the right served as Control and was not treated with Zoono, yet routinely cleaned through standard practices.

Control areas were designed to represent the bio-load accumulation that would build up if areas were left without being treated by a protectant. The resulting data should quantify, in the “real-world” settings identified, that Zoono, as a compliment to existing best hygienic practices, delivers a superior, sustained antimicrobial result.

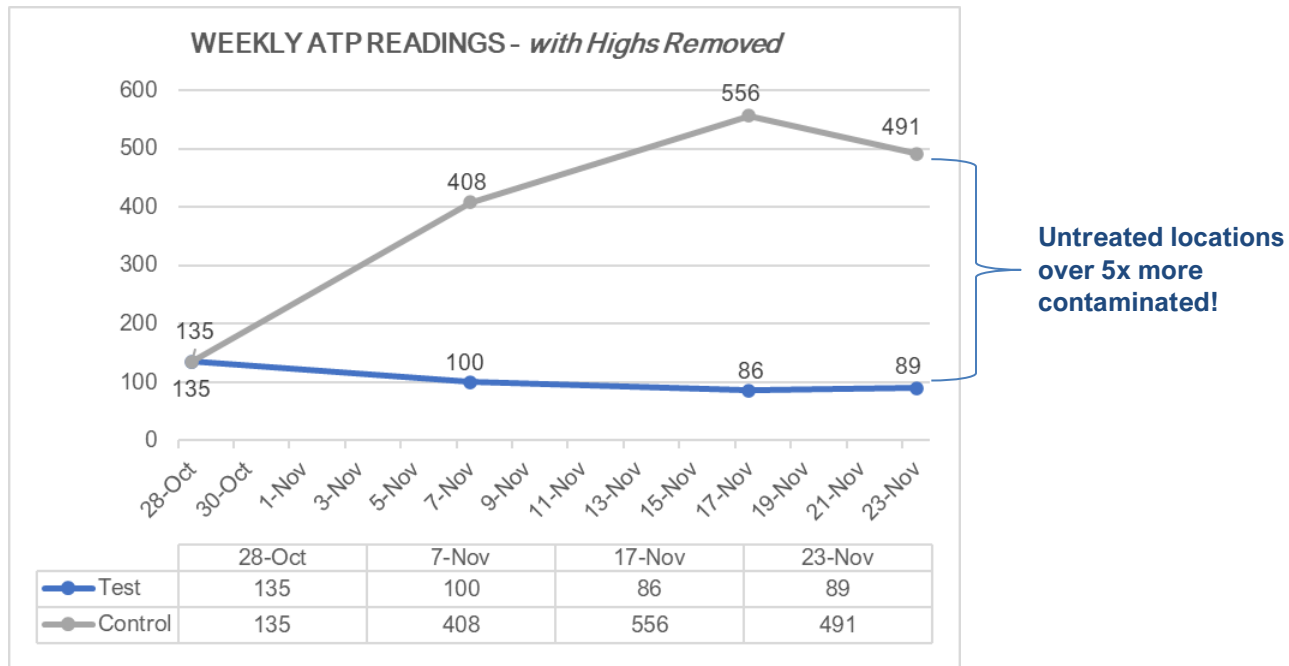
In order to show the compounding and aggregating effect of Zoono, this use case protocol called for weekly application of Zoono on treated surfaces; however, Zoono has proven time and time again via real-world testing that monthly application is sufficient to preserve the hygienic state of an environment long after disinfecting.

RESULTS

Zoono Microbe Shield clearly demonstrated the ability to reduce bioloads immediately and persistently, over time yielding significantly more hygienic target surfaces than untreated environments. In fact, **untreated surfaces were over five times more contaminated than Zoono-treated surfaces after three weeks.**

Important to note that in order to mitigate the distortion of the data by random variances, we have removed the high anomalies within the results referenced and charted below.

Test (treated) surfaces experienced a weekly decline in contamination level, ultimately improving by 34%, from a baseline reading of 135 to an Interval 3 reading of 89. This reading is “Considered Clean” on the ATP Scale. Alternatively, the Control (untreated) surfaces experienced a consistent weekly increase in contamination level, ultimately climbing from a baseline reading of 135 to a Week 3 reading of 491 – a reading signifying “Contaminated” and within less than 10 points of “High Risk of Infection” on the ATP Scale.



About ATP Readings:

ATP is a measure of general contamination and does not identify any specific pathogen. Environmental contamination is measured through the detection of **Adenosine triphosphate (ATP)**, which is found in the cellular make-up of living organisms. Therefore, the amount of ATP present is a widely accepted gauge of microbial and bacterial contamination.

- Below 100 are considered “Clean” – a generally acceptable reading
- 100-200 indicate additional attention is required
- Above 200 are Contaminated

ATP Test Result Scale

0 - 30	Considered Food Safe
31 - 100	Considered clean
101 - 200	Caution!
201 - 500	Contaminated
501 - 1000	High Risk of Infection
1000 +	Extreme Risk of Infection

BUSINESS IMPLICATIONS

- **Safety** – First and foremost, the addition of Zoono to LAX's cleaning and sanitation practices will help protect travelers and employees from illness, virtually removing surfaces and hands from the cycle of infection. While the current protocol of cleaning and disinfecting can only keep surfaces clean for 5-10% of the year, the addition of Zoono could preserve the hygienic state of surfaces continually throughout the year.
- **Cost Savings** – LAWA will continue with standard cleaning procedures to regularly remove gross contamination for surfaces, but given that Zoono keeps surfaces cleaner longer, the frequency of disinfecting can decline, which will lead to both product and labor savings.

Below is a comparative model that measures the cost of LAX's current disinfection practices against a new protocol that incorporates Zoono, plus less frequent application of a traditional disinfectant. This model assumes that LAWA is treating one million square feet of LAX with a \$35/gallon disinfectant once per week. The recommended protocol is to treat with Zoono once per month and decrease application of a traditional disinfectant to once every two weeks.

Cost Analysis of LAX's Current Disinfectant Practices vs. Proposed Protocol			
Protocol	Product Costs	Labor Costs	Total Costs
Current Assumed Protocol: Treating 1M sqft with Traditional Disinfectant once/week	\$ 455,000	\$ 780,000	\$ 1,235,000
Proposed Protocol: Treat 1M sqft with Zoono once/month and with Traditional Disinfectant every two weeks	\$ 534,000	\$ 540,000	\$ 1,074,000
Total Savings	\$ (79,000)	\$ 240,000	\$ 161,000
Percent Change	17%	-31%	-13%
Assumptions Include: Traditional Disinfectant = \$35.00/gallon Zoono = \$108/gallon (list price) Both products treat 4,000 sqft/gallon Cost of cleaning/sanitation labor = \$30.00/hour Coverage by cleaning personnel per hour = 2,000 square feet			

Important Note: If this model were run against 7M square feet of coverage, LAWA may experience \$1.5M in cost savings given product cost efficiencies with such scale.

- **PR and Marketing Benefits** – The upgrade of Zoono to LAWA's cleaning protocol can trigger significant opportunities for positive press, perhaps similar to the coverage United Airlines received after adding Zoono to its new safety protocol (Good Morning America, ABC News, CBS News, etc.). This upgrade also has the unique ability to increase consumer confidence in traveling post-COVID, showing travelers that both airlines and airports have taken heightened measures for their safety. The ability for LAWA to market its new safety and sanitation procedures and that it's doing everything it can to protect passengers and employees can drive serious topline revenue for the city of Los Angeles.

External and internal PR angles may include:

- Positioning LAX as the cleanest airport in the country or joining Hong Kong and Dubai as one of the cleanest in the world
- Promoting new safety measures at LAX to attract new visitors to the city of Los Angeles
- Helping LAWA reinforce its commitment to maintain LAX as a world-class airport
- Incorporating Zoono into LAX's #TravelSafely campaign
- Driving comfort and loyalty among employees by "investing in" their safety

FINAL RECOMMENDATION

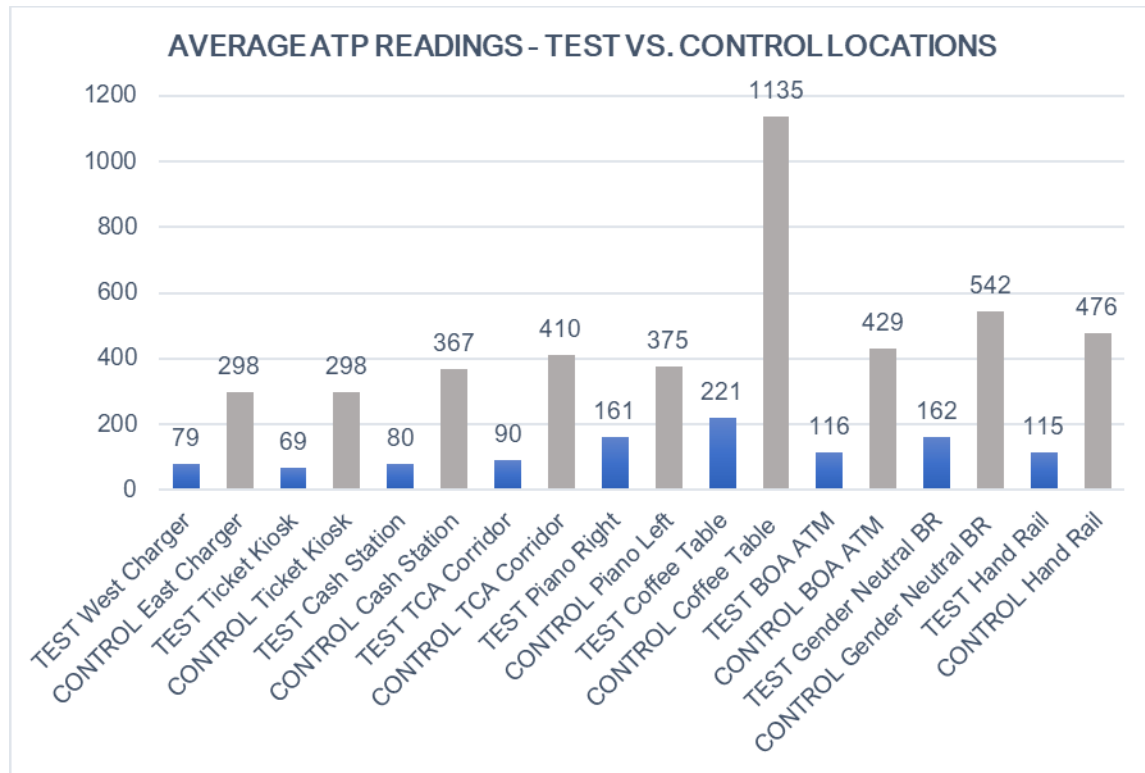
Given the powerful performance witnessed in this use case, we recommend LAWA update its safety protocol to include the use of two globally recognized Zoono products:

- 1) Zoono Microbe Shield Surface Protectant** – We highly recommend LAWA treat (select or all) high traffic areas with Zoono once per month and decrease the application of a traditional disinfectant to every two weeks.
- 2) Zoono ULTRA Hand Sanitizer** – We also recommend LAWA make Zoono's 24-hour hand sanitizer available to all LAX employees (via stations at employee checkpoints, lounges, etc.) to provide increased protection for its workforce and decrease absenteeism. Employees would apply hand sanitizer once upon arrival and their hands will be free from contamination for their entire shift.
 - There is wide testing and data available to support the efficacy of Zoono Hand Sanitizer. These reports can be provided upon request.

APPENDIX I – FULL TEST DATA

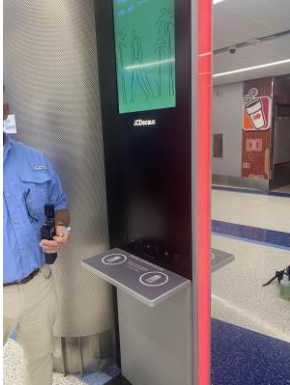
LAX ATP TEST SUMMARY						
	Baseline 28-Oct	Interval 1 7-Nov	Interval 2 17-Nov	Interval 3 23-Nov	Point Chg Base to Last	% Chg Base to Last
Test						
Total Raw Average	165	113	101	99	-66	-40%
Average with High Removed	135	100	86	89	-46	-34%
Average with High+Low Removed	145	111	93	103	-42	-29%
Control						
Total Raw Average	155	535	661	577	422	272%
Average with High Removed	135	408	556	491	356	263%
Average with High+Low Removed	145	436	582	504	359	248%

WEEKLY RAW DATA BY TEST LOCATION						
Test - Zoono Treated						
Test #	Location	Baseline 28-Oct	Interval 1 7-Nov	Interval 2 17-Nov	Interval 3 23-Nov	
1	Terminal 7 West Charger	64	63	101	86	
2	Ticket Kiosk 33	78	67	40	92	
3	Ready Cash Station West	89	44	82	104	
4	TCA Corridor Outside	98	81	60	121	
5	Grand Piano Right	230	150	114	148	
6	Klatch Coffee Table (Dark)	288	208	224	164	
7	BOA ATM (74-77)	146	162	88	67	
8	Gender Nutral BR (77)	401	23	61	N/A	
9	Hand Rail LOW R	87	220	143	8	
Average		165	113	101	99	
Control - Untreated						
Test #	Location	Baseline 28-Oct	Interval 1 7-Nov	Interval 2 17-Nov	Interval 3 23-Nov	
1	Terminal 7 East Charger	68	331	372	422	
2	Ticket Kiosk 32	82	284	394	431	
3	Ready Cash Station East	98	376	471	523	
4	TCA Corridor Inside (Ele)	88	420	515	616	
5	Grand Piano Left	285	214	473	528	
6	Klatch Coffee Table (Light)	315	1552	1497	1176	
7	BOA ATM (70A)	196	526	580	414	
8	Gender Nutral BR (70B)	163	463	1001	N/A	
9	Hand Rail Mid R	102	653	642	506	
Average		155	535	661	577	



APPENDIX I – PHOTOS OF SELECT TEST LOCATIONS

TEST LOCATION #1



TEST: Term 7 West Charger



CONTROL: Term 7 East Charger

TEST LOCATION #2



TEST: Ticket Kiosk 33



CONTROL: Ticket Kiosk 32

TEST LOCATION #3



TEST: Ready Cash Station West

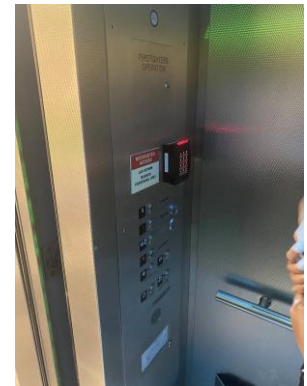


CONTROL: Ready Cash Station East

TEST LOCATION #4



TEST: TCA Corridor Outside



CONTROL: TCA Corridor Inside

TEST LOCATION #5



TEST: Grand Piano Right



CONTROL: Grand Piano Left

TEST LOCATION #6



TEST: Coffee Table (Dark)



CONTROL: Coffee Table (Light)