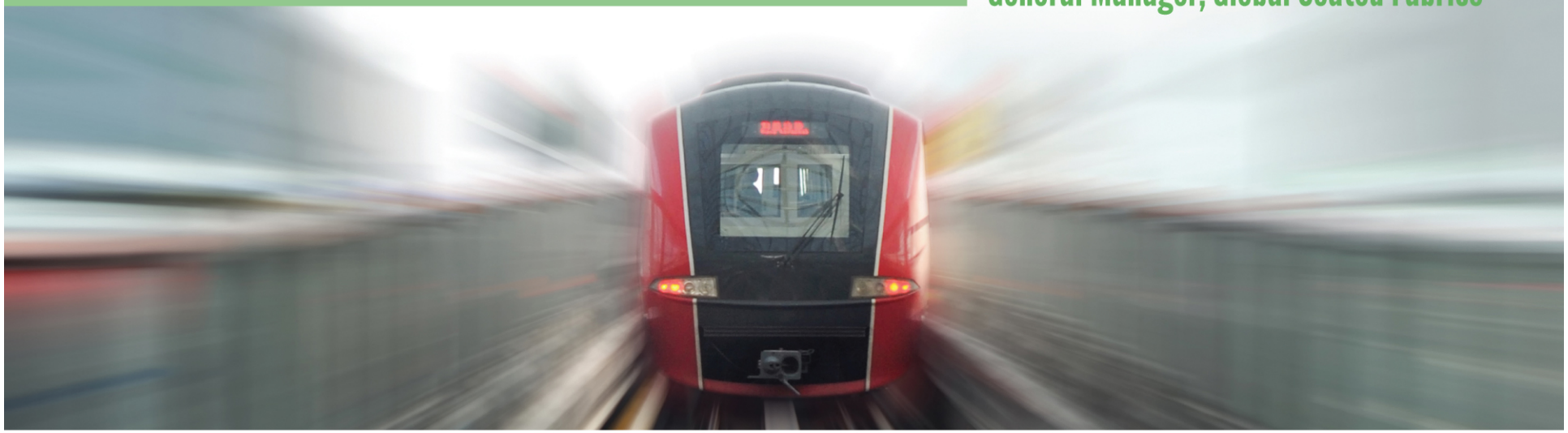
PREVAILL™ TRANSIT with PreFixx®

Coated Fabrics for Mass Transit Seating

Scott Gipson

General Manager, Global Coated Fabrics



Case Study: BART Railcar Refurbishment

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Project Background

- San Francisco Bay Area Transit Authority
  - Bay Area Transit Authority AKA B.A.R.T.
  - 5th busiest heavy rail rapid transit system in US
  - Five lines on 104 miles (167 km) of track with 44 stations in four counties
  - 669 railcars in the system
  - 370,000 riders weekly
  - Wool covered seats installed in 1972

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BART's Problem

- Wool-covered seats **looked, felt and smelled bad**
- **High Annual Maintenance Costs** - cleaning and replacing seats
- **Negative Publicity** raised awareness of high potential for germs to be retained despite regular cleaning

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High Maintenance Costs

- Annual cleaning costs using outside service: $600,000
- Wool-based fabrics required replacement every 3 years
- Replacing fabric seats cost $15,500 per railcar

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Negative Publicity

- NY Times article highlighted the inherent high potential for germs to be retained in the existing wool-fabric
- San Francisco State University Biology Lab analyzed random seat covering
- Mold and bacteria found including three resistant to antibiotics
- Even after cleaning, potentially harmful bacteria was found

Reprinted from

The New York Times

Us

On BART Trains, the Seats Are Taken (by Bacteria)

By ZUSHA ELINSON

Carrie Nee prefers to stand during her half-hour commute on BART from San Leandro to downtown San Francisco. Although the trains' blue fabric seats are plush and comfortable, Ms. Nee refuses to sit on them.

"I would love to sit down, but it just grosses me out. They're disgusting," said Ms. Nee, a 26-year-old records clerk.

Riders on the Bay Area Rapid Transit system have long complained about germs in the hard-to-clean cloth seats. As Bob Franklin, the BART board president, acknowledged, "People don't know what's in there."

Now they do.

The Bay Citizen commissioned Darleen Franklin, a supervisor at San Francisco State University's biology lab, to analyze the bacterial content of a random BART seat. The results may make you want to stand during your trip.

Fecal and skin-borne bacteria resistant to antibiotics were found in a seat on a train headed from Daly City to Dublin/Pleasanton. Further testing on the skin-borne bacteria showed characteristics of methicillin-resistant staphylococcus aureus, or MRSA, the drug-resistant bacterium that causes potentially lethal infections, although Ms. Franklin cautioned that the MRSA findings were preliminary.

High concentrations of at least nine bacteria strains and several types of mold were found on the seat. Even after Ms. Franklin cleaned the cushion with an alcohol wipe, potentially harmful bacteria were found growing in the fabric.

Dr. John Swartzberg, a clinical professor at the School of Public Health at the University of California, Berkeley, played down the threat of infection from harmful bacteria on a BART seat. "I suspect it's not a very big problem," Dr. Swartzberg said. "That said, if there's another way to do it, where you can clean it better, then you should do it."

He said the cloth seats most likely allowed bacteria to flourish because they were more difficult to clean and disinfect.

James Allison, a BART spokesman, wrote in an e-mail that the findings were "not surprising," considering that 330,000 commuters rode the trains daily. Last year, the BART police received 1,051 complaints of smoking, eating and drinking; 245 complaints of urinating or defecating; and 56 reports of spitting.

Mr. Allison encouraged riders to wash their hands and use hand sanitizers available at BART stations.

Hygiene has emerged as a key issue as BART officials determine what kind of seats to install for a new fleet of cars in 2017. In January, system employees were invited to test a variety of seat models at a Hayward warehouse. One employee, Melissa Jordan, filed a report on BART's Web site about the trade-offs in selecting the new seats.

"Can I live with some type of seat that's less cushiony — maybe padded vinyl instead of fabric — if it's easier to keep clean?" Ms. Jordan wrote.

Ms. Franklin's analysis also revealed that Muni, which uses acrylic plastic seats, appears to be more sanitary.

She tested a seat on the No. 28 bus, a route frequented by college students traveling from San Francisco State to Daly City. Two benign bacteria colonies were found. Unlike the BART seat analysis, Ms. Franklin's test of the Muni seat after cleaning it with an alcohol wipe detected no bacteria.

Ms. Franklin tested the BART seat at the back of a Dublin/Pleasanton-bound train in the midafternoon. A swab taken from the seat cushion and headrest produced a veritable forest of mold and colorful bacteria.

In two separate tests, Ms. Franklin identified characteristics of the MRSA bacteria growing in the seat. The first test confirmed the presence of staphylococcus aureus, the skin-borne bacteria. A second confirmed that the bacteria, like MRSA, was resistant to the antibiotics methicillin and penicillin. But a third test intended to isolate the MRSA bacteria was negative.

MRSA is known as the "superbug" because it is resistant to antibiotics. It infects people through open wounds, attacking the immune system; 19,000 deaths each year are related to MRSA infections, according to the Centers for Disease Control and Prevention.

"There's a probability that it is MRSA, but more tests would need to be done," Ms. Franklin said. "Somebody probably was wearing shorts and had an infection, and there you go. It is concerning."

Ms. Franklin identified two other bacteria strains that she said resulted from fecal contamination of the BART seat. Those strains were also resistant to antibiotics. The other bacteria did not appear to be harmful and are found throughout the environment, Ms. Franklin said.

Reprints available from OMNOVA. Stand #3042

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BART: Finding a Solution

- BART engaged LTK Engineering Services to assist in solving the problem
- Seat replacement part of overall interiors upgrade
- Alternative materials evaluated to upgrade maintainability
  - Improved appearance
  - Improved germ resistance
  - Lower cost
- Seat Design Objectives
  - Visible differences
    - material
    - color
    - tailoring
  - Invisible differences
    - fire safety
    - durability
    - cleanability
    - sustainability

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12 Seating "Labs" Developed for Rider Input

Omnova's commitment to sustainability

Vinyl has a bad reputation, but Omnova is leading the industry in developing sustainable vinyl systems

- Omnova manufacturing process traps and recycles harmful vapors to prevent release during production
- Omnova led the industry by reclaiming used wall covering material and **has committed to initiate an end-of-life reclamation program for BART vinyl seats**

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Seating Lab Study Results

- Range of materials presented to riders
- Cleanliness was primary concern
  - Rated “very important” by 81% of respondents
- Clear preference for VINYL

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BART Selects PreVaill Transit

- OMNOVA's PreVaill Transit Vinyl upholstery
  - Engineered for mass transit applications
  - Features industry-leading PreFixx protective finish; excellent durability and cleanability
  - Improved appearance
  - Longer life expectancy (10 yrs vs 3 yrs)
  - Improved cleanability (wipe clean)
  - Lower initial investment and maintenance costs

PREVAILL™ TRANSIT

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BART: Moving Forward

- Custom **PreVaill Transit** upholstery design representing local influence

- ***Water, Wine, Waves***
- *. . . Bay Area Centric Design*
- *The Bay, Pinot Noir, Lines of Activity*

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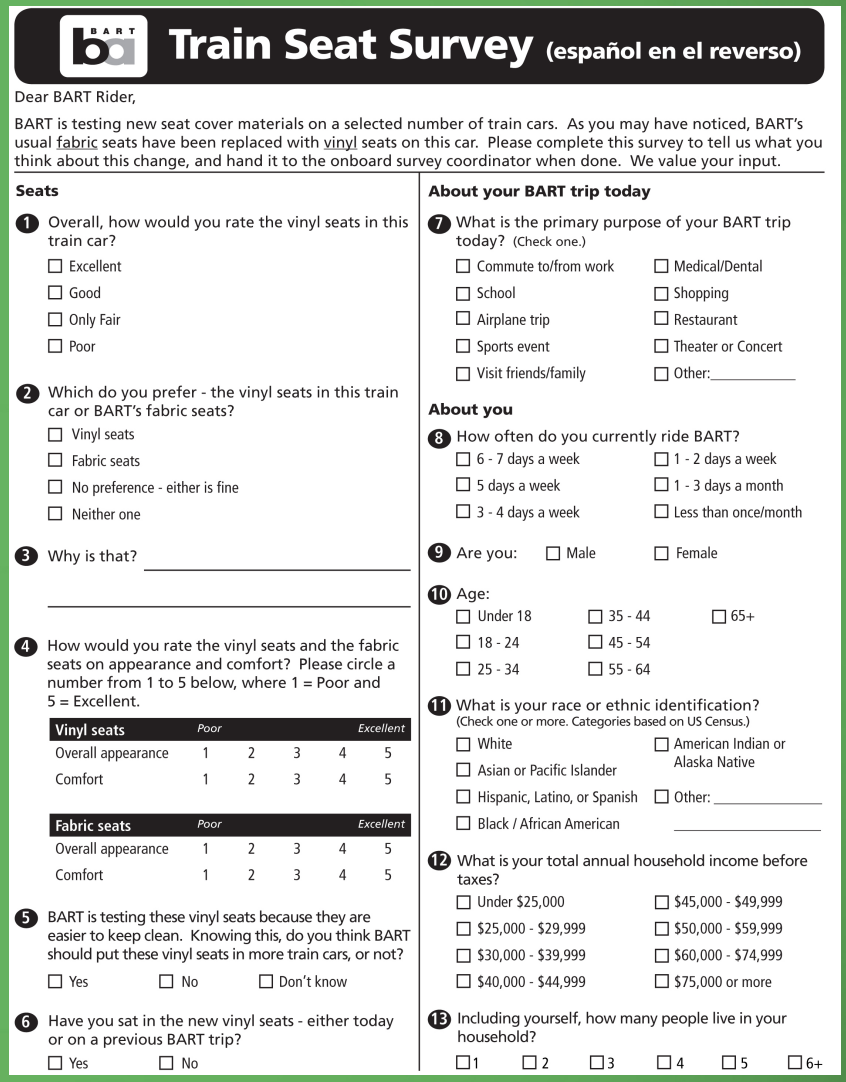
Rider Feedback: BART Research

- Research Objectives
  - Determine BART customers preference of vinyl seating
  - Uncover any concerns with new seat materials
- Methodology
  - On-board survey
  - 1,250 completed surveys
  - Response rate: 70%



Train Seat Survey (español en el reverso)

Dear BART Rider,

BART is testing new seat cover materials on a selected number of train cars. As you may have noticed, BART's usual fabric seats have been replaced with vinyl seats on this car. Please complete this survey to tell us what you think about this change, and hand it to the onboard survey coordinator when done. We value your input.

Seats

1. Overall, how would you rate the vinyl seats in this train car?
   - ☐ Excellent
   - ☐ Good
   - ☐ Only Fair
   - ☐ Poor
2. Which do you prefer - the vinyl seats in this train car or BART's fabric seats?
   - ☐ Vinyl seats
   - ☐ Fabric seats
   - ☐ No preference - either is fine
   - ☐ Neither one
3. Why is that? _____
4. How would you rate the vinyl seats and the fabric seats on appearance and comfort? Please circle a number from 1 to 5 below, where 1 = Poor and 5 = Excellent.

Vinyl seats	Poor				Excellent
Overall appearance	1	2	3	4	5
Comfort	1	2	3	4	5

Fabric seats	Poor				Excellent
Overall appearance	1	2	3	4	5
Comfort	1	2	3	4	5

5. BART is testing these vinyl seats because they are easier to keep clean. Knowing this, do you think BART should put these vinyl seats in more train cars, or not?
   - ☐ Yes ☐ No ☐ Don't know
6. Have you sat in the new vinyl seats - either today or on a previous BART trip?
   - ☐ Yes ☐ No

About your BART trip today

7. What is the primary purpose of your BART trip today? (Check one.)
   - ☐ Commute to/from work ☐ Medical/Dental
   - ☐ School ☐ Shopping
   - ☐ Airplane trip ☐ Restaurant
   - ☐ Sports event ☐ Theater or Concert
   - ☐ Visit friends/family ☐ Other:_____

About you

8. How often do you currently ride BART?
   - ☐ 6 - 7 days a week ☐ 1 - 2 days a week
   - ☐ 5 days a week ☐ 1 - 3 days a month
   - ☐ 3 - 4 days a week ☐ Less than once/month
9. Are you: ☐ Male ☐ Female
10. Age:
    - ☐ Under 18 ☐ 35 - 44 ☐ 65+
    - ☐ 18 - 24 ☐ 45 - 54
    - ☐ 25 - 34 ☐ 55 - 64
11. What is your race or ethnic identification? (Check one or more. Categories based on US Census.)
    - ☐ White ☐ American Indian or Alaska Native
    - ☐ Asian or Pacific Islander
    - ☐ Hispanic, Latino, or Spanish ☐ Other: _____
    - ☐ Black / African American _____
12. What is your total annual household income before taxes?
    - ☐ Under $25,000 ☐ $45,000 - $49,999
    - ☐ $25,000 - $29,999 ☐ $50,000 - $59,999
    - ☐ $30,000 - $39,999 ☐ $60,000 - $74,999
    - ☐ $40,000 - $44,999 ☐ $75,000 or more
13. Including yourself, how many people live in your household?
    - ☐1 ☐2 ☐3 ☐4 ☐5 ☐6+

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BART Research: The Results

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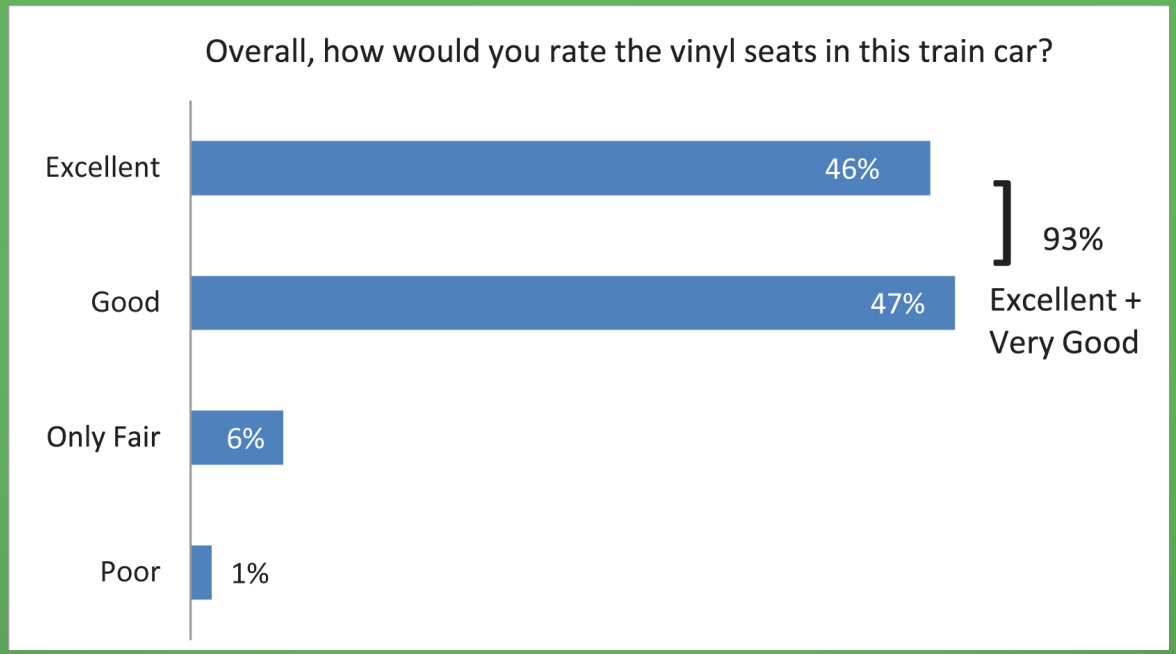
BART Research Results

Vinyl Seat Covers Survey Results

BART Marketing and Research

- New vinyl seat covers were well received by riders
- 93% rated them as EXCELLENT or VERY GOOD



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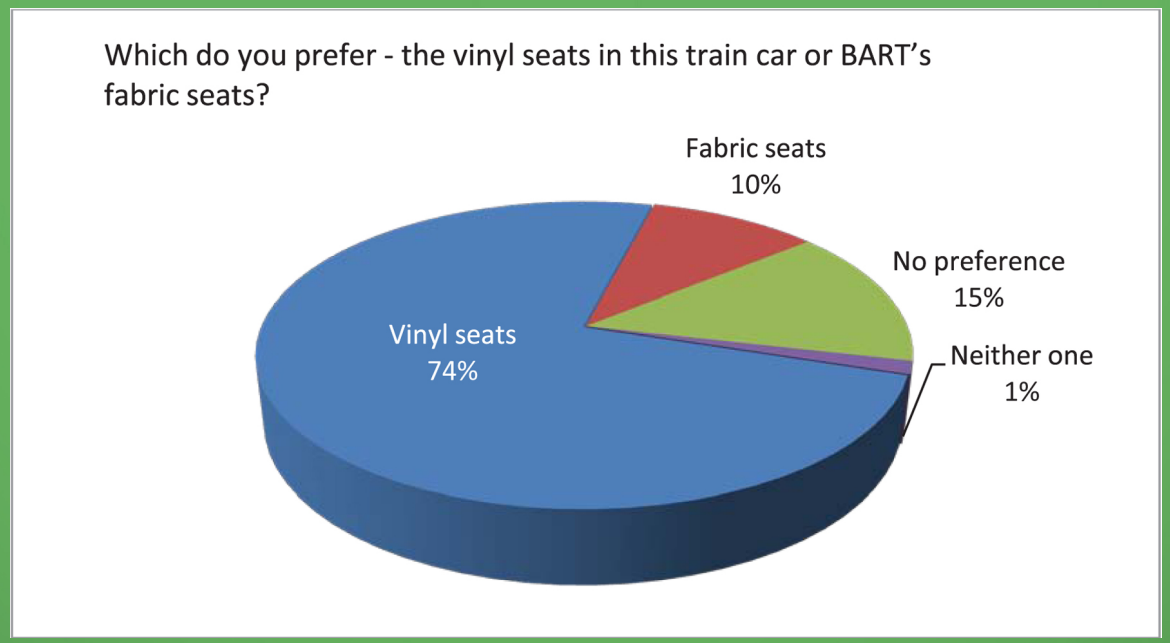
BART Research Results

Vinyl Seat Covers Survey Results

BART Marketing and Research

- 74% of riders prefer the vinyl seats to the fabric seats



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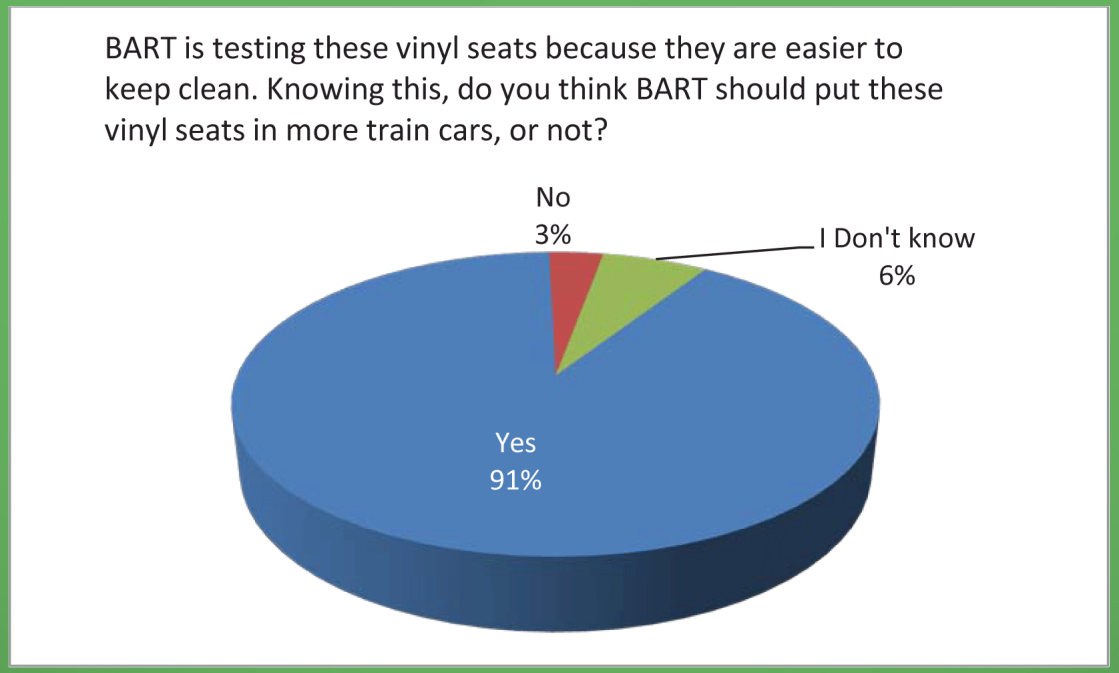
BART Research Results

Vinyl Seat Covers Survey Results

BART Marketing and Research

- When customers were told that the new vinyl seats are easier to clean, 91% indicated that BART should broadly implement change on more seats



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Want to learn more?

- Visit OMNOVA Solutions at Stand #3042
- Website: www.omnova.com/PREVAILLTRANSIT
  - Product specifications
  - Case study
- Scott Gipson

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- www.BART.gov
- http://www.bart.gov/docs/cars/Vinyl_Seat_Survey_Results.pdf

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