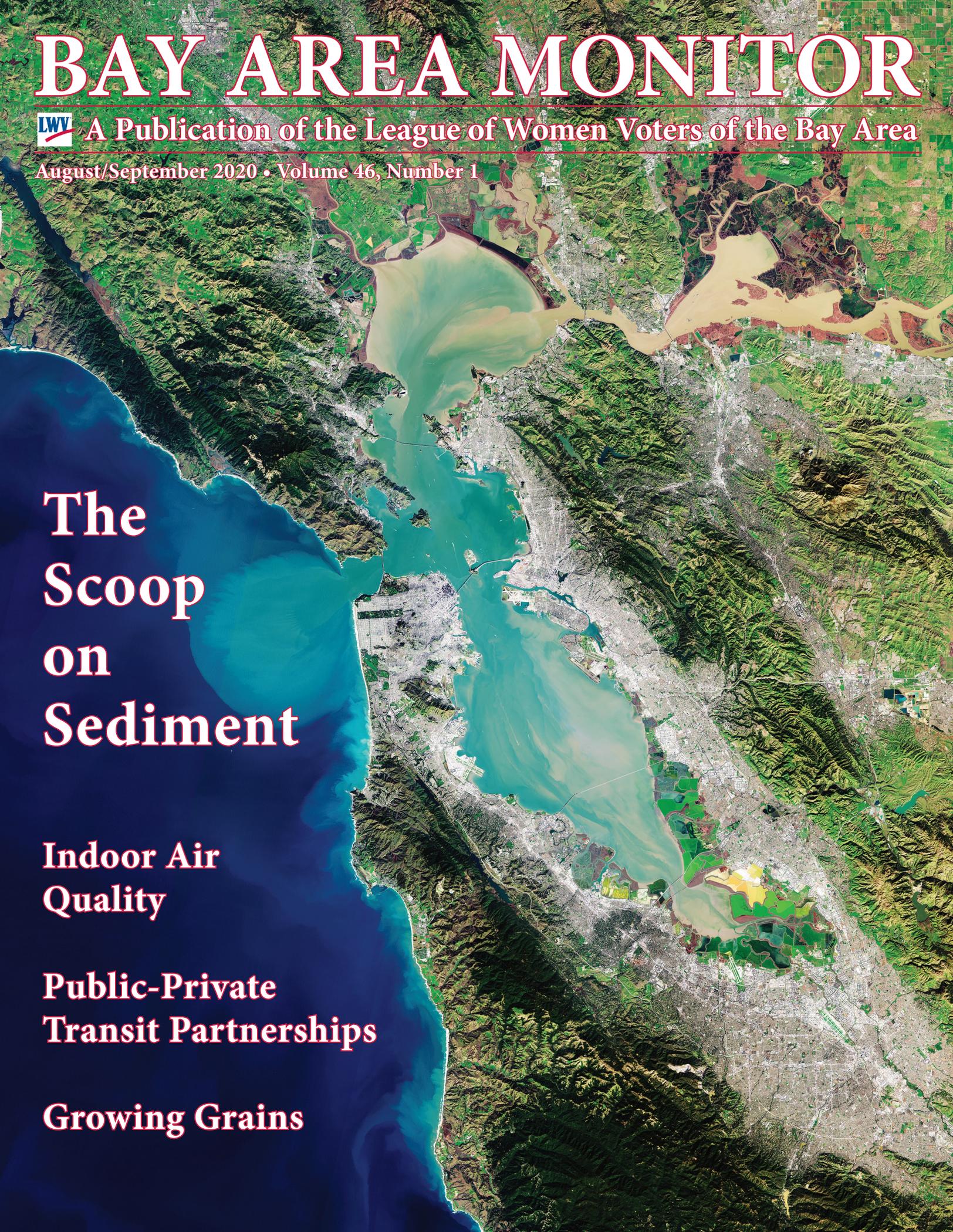


BAY AREA MONITOR



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The Scoop on Sediment

Indoor Air
Quality

Public-Private
Transit Partnerships

Growing Grains

Avoiding Disaster

Given the unprecedented turmoil that 2020 has wrought thus far, we understand if you have more pressing concerns on your mind right now than the upcoming November 3 election. But the League of Women Voters is squarely focused on this looming landmark occasion, and we're going to do our best to help everyone prepare for it.

Longstanding readers of the *Monitor* understand that this publication fills a specialized communications role within broader League operations, and as a result the magazine plays a proportionally smaller role during election season, when voter service becomes a more pertinent aspect of our organizational efforts. Nonetheless, we are happy to dedicate space here in promotion of that vital work, particularly given the electoral challenges that lie ahead.

Those challenges include the myriad constraints imposed by the COVID-19 pandemic, and attendant issues such as insufficient funding for administering the election, technological and procedural glitches, and the threat of disinformation campaigns both foreign and domestic. For a thorough consideration of these pitfalls, head to Politico.com for their July 24 article "8 Big Reasons Election Day 2020 Could Be a Disaster." Reading it may alarm you, but you can confront those feelings of distress by conferring with a local League to see how you can help be a part of the solution. Visit LWVBA's website at lwbayarea.org/local-leagues-2 to determine which of the 20 local Leagues in the Bay Area you should contact. Wherever you live in the region's nine counties, chances are we have an affiliate you can connect with.

After all, LWVBA encompasses an expansive domain. Its full scope is on display on our front cover of this edition. The January 25, 2019 image comes courtesy the European Space Agency's Copernicus Sentinel-2 satellite mission, and we offer it as preview for Robin Meadows' article on sediment — a large plume of which can be seen flowing out from the Golden Gate into the Pacific. More concentrated sediment is visible in the brown hues coursing from the Sacramento-San Joaquin River Delta into San Pablo Bay.

You can learn more about this unheralded yet valuable substance in Robin's article, and elsewhere in this edition find out about indoor air quality from Leslie Stewart, public-private partnerships for transportation services from Cecily O'Connor, and wheat cultivation from Aleta George. Accompanying that last article, this edition's back cover features a photo (courtesy of Frog Hollow Farm) of workers on a wheat harvester.

We're pleased to present this inaugural edition of our 46th volume, and we look forward to bringing you the remaining five editions scheduled for our 2020-21 publication year. As I've



mentioned in the past two editions, that prospect has seemed dicey due to budget troubles, but most of our funders have come through with continued sponsorship pledges that, along with some belt-tightening on our part, should keep us afloat in the near term. We appreciate the support from them and from our readers, who continue to show us great generosity. In terms of the most recent contributions, we'd like to acknowledge donations from Suzanne Barba, David Calkins, Tamra Hege, Jean Matsuura, Marian Shostrom, Susan Polgar, Marjorie Blackwell, Crownie Billik, Alice Smith, and Sally Faulhaber.

Finally, we again entreat you to sign up for our weekly *Monitor Notes* email newsletter at www.bayareamonitor.org/subscribe — it will tide you over until our next edition in October, and might just come in handy as we all approach that big day in November.

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The Air in There: Building Ventilation Key During COVID-19

By Leslie Stewart

When air outdoors is unhealthy because of toxic gas, smoke, or tiny particles of diesel soot, people are advised to protect themselves by going outdoors and shutting out outside air. However, breathing the air indoors isn't always very healthy either, even if people aren't choking, gasping, or getting very sick. For example, natural gas fumes from home heating and cooking can provoke asthma, and overall indoor air quality is typically two to five times worse than outdoors. Now there are additional concerns about the air we share indoors, as research on COVID-19 has made clear that the primary way it spreads is through small-to-microscopic droplets expelled into the air by infected people.

People have turned to using outdoor spaces during California's sunny, dry summer. This may help them avoid unhealthy indoor air, but it's temporary, subject to disruption by heat and smoke events, and doesn't work for everyone all the time. Instead, using lots of that outdoor air to make indoor air healthier is recommended for better air management in buildings in order to counteract indoor air pollution and deter the transmission of coronavirus.

The coronavirus pandemic has added urgency to the science and mechanics of creating "healthy buildings." The term was originally coined as a counterpoint to "sick buildings" in which emissions from materials inside a well-sealed building make occupants ill, but now when experts talk about healthy buildings they're usually referring to best practices for design and operation that supports human health. Ventilation remains one of those key ways to create and maintain healthy homes, schools, and workplaces.

Harvard's T. H. Chan School of Public Health demonstrated in 2017 that improving air circulation in offices can have a significant effect on both health and productivity. Likewise, stuffy classrooms impact student performance, according to a recent study by Lawrence Berkeley Laboratory and UC Davis, which corroborated other studies showing that many K-12 schools are not meeting basic air circulation standards. A separate 2019 study published in *Scientific Reports* demonstrated how poor

airflow in classrooms could lead to higher flu transmission.

This research is newly relevant as households, school administrators, employers, churches, and others make plans to move forward while coronavirus is still a threat. The Center for Disease Control's interim guidance for employers and businesses calls for increasing overall ventilation rates, and also increasing the percentage of outdoor air in systems which recirculate the air in a building.

Deborah Bennett, a public health professor at UC Davis, commented that some buildings could have difficulty following that guidance as businesses and offices re-open. "Commercial buildings don't always have ventilation that meets code," she explained, "and even when they do, the code is set to require a minimal air exchange rate" which may not be sufficient to protect against coronavirus. To do that, Bennett affirmed, "you need to bring in more outdoor air."

The American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) has issued several coronavirus-specific advisories to its members, many of whom are responsible for ventilation systems. They recommend that



Opening a window is a simple yet vital way to improve indoor air quality and keep buildings healthy.

photo by Alec MacDonald

facilities operators should disable demand-controlled ventilation and open outdoor air dampers to 100 percent as indoor and outdoor conditions permit, and keep systems running longer hours (or constantly, if possible).

Although recirculating air is energy-efficient, it can spread virus particles if they are present. Scientists and engineers agree that dampers should be re-set to eliminate air recirculation, and air conditioning units should operate on outside air only. If this isn't feasible, bringing in as much outside air as possible, and adding filters or using in-duct ultraviolet irradiation on recirculated air, are recommended alternatives.

In addition to re-setting controls, experts say it's a good idea to have the ventilation systems inspected and repaired if necessary. "Check for stuck dampers, switch out filters," advised Bennett. Such maintenance is usually not cost-prohibitive and

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will bring these spaces into the healthy zone for occupants. In some circumstances, a check-up may find a system is unable to meet the new performance recommendations; replacement could be a necessary investment to allow the building to be utilized in the current environment.

The essential point, according to Bennett, is “making sure you’re maximizing ventilation.” She noted that school ventilation studies have already led some districts to install CO₂ monitors in classrooms to measure whether ventilation is adequate. These monitors are recommended for all school districts as part of a set of guidelines for re-opening classrooms produced by the Coalition for Adequate School Housing. CO₂ monitors can also be used in office buildings and other spaces where stale and therefore possibly contaminated air may build up.

What about homes? Again, the key is outside air. In a research letter published in the scientific journal *Environment International*, the authors wrote, “In residential houses and apartments, normal practices (e.g. segregating infected individuals, opening windows and doors, and using portable air-cleaning devices when practical) to ensure healthy indoor air, should stay in place.”

However, ensuring healthy indoor air may not be as simple as opening doors and windows. Outdoor air quality may be poor. As Bennett conceded, “it’s a judgment call — in a building next to a highway it’s probably not the best idea, but if the outdoor air is fairly clean, go ahead and do it.”

Temperature and humidity also play a role. Residents will be reluctant to open their homes to hot dry air, or cold damp air in winter, so their HVAC systems will need to be effective

as well. Jeffery Laing, project manager for BayREN’s Single Family Program focusing on electrification, explained that “electric heat pump [heating and cooling] systems which tie into ducts will be filtered to the recommended MERV-13 level at least.” The MERV rating system indicates a filter’s ability to catch particles; a MERV-13 filter captures 90 percent of most particles and 50 percent of the tiniest particles, as small as .03 microns. However, Laing admitted, “the ducts themselves can pull in 30 to 80 percent of their air from other areas of the home. In that respect, the mini-split non-ducted systems may be healthier.” The non-ducted systems simply recirculate air within a living space instead of sending it through ducts that include filters, but they are less likely to pick up contaminants from gas appliances or garage spaces. In small personal spaces, portable air-cleaners can also help; filters should be MERV-13 or the even more efficient HEPA filters, and they must be kept clean.

Reducing other toxic indoor contaminants, such as fumes from gas-fueled appliances, can also contribute to a home where residents are better protected against a virus which attacks through the respiratory system. Ultimately, Laing commented, “you want outside air, and the issue is how to be sure it’s healthy when it comes inside, and that it stays healthy.”

Adapting to the need for high-volume ventilation in many of the spaces used for daily life will have some side effects. One of those is energy use. Bennett observed that “any time you bring air into a building, you are probably also using energy to either heat it or cool it.” The energy use drops if air is recirculated, because it is already close to the desired temperature, but as noted, this can increase the danger of contamination. In addition, ASHRAE recommends bypassing energy recovery units in ventilation systems, which can leak potentially contaminated exhaust air into the incoming fresh outdoor air supply.

Most changes to ventilation in public spaces will be made based on recommendations and guidelines, in some cases with revised performance standards, rather than through new codes and enforcement. “Codes aren’t going to help us in the near future,” said Bennett, “because they only apply to new construction.”

In most existing buildings, the only regulations that apply are worker safety and public health requirements, although school districts may set additional rules. One government restriction that has already been applied in some areas is reducing the number of people in a space, such as restaurants and salons, which can compensate for less efficient ventilation. Joseph Allen at Harvard’s T.H. Chan School of Public Health refers to this as “de-densification”. “[Y]ou have to think about the space where



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we have people, how close they are together and what controls are in place,” Allen said in a press conference in May. “There’s no such thing as zero risk in anything we do, certainly not during a pandemic. But if you layer enough of these control strategies on top of each other, you can significantly reduce risk.”

Private property rights apply to homes, so it will be up to residents to create healthy spaces according to the same

simple rules underlying the professional advice for other buildings: More airflow is better, outside air is (usually) better than inside air, fewer people breathing in a room is better than many. The proverbial breath of fresh air is the preferred option for staying healthy, indoors as well as out. 

Leslie Stewart covers air quality and energy for the Monitor.

Transit Agencies Partner with Private Companies to Improve Service

By Cecily O’Connor



Usage of Uber software by Marin Transit’s on-demand shuttle van service Connect is one of many public-private partnerships studied in a recent national report on transit and mobility.

photo courtesy of Marin Transit

Bay Area cities and transit agencies are partnering with private companies to expand coverage and accessibility — transportation challenges they were tussling with long before COVID-19 lockdowns reduced ridership and farebox revenue this spring.

COVID-19 “will add the pressure for agencies to innovate, and ridesharing could be a big part of the picture,” said Joe Schwieterman, director of DePaul University’s Chaddick Institute for Metropolitan Development, which studies partnerships between public agencies and private transportation network companies (TNCs) like Uber and Lyft.

Fallout from the pandemic is forcing agencies to reckon with changing transit commute patterns, new work-at-home arrangements, and the additional incentivization of car use from low gas prices — concerns presented in a report Schwieterman co-authored entitled *21 Key Takeaways from Partnerships between Public Transit Providers & Transportation Network*

Companies in the United States. Published in April, it highlighted the ways in which ride-hailing service partnerships can tap new markets and stretch resources, examining them to understand when they are advantageous, face hurdles, or offer lessons.

For instance, programs subsidizing rides by a fixed amount per trip are administratively simpler and easier for consumers to understand. In addition, on-demand programs are poised to become more common in rural and suburban areas.

Most public-private partnerships start with a need to improve mobility in areas where transit is lacking, as well as to respond to challenges or policy goals like reducing greenhouse gas emissions. Ridership tends to be made up of people needing first/last-mile transit connections, ADA paratransit service, and connections that accommodate late-night travel.

Partnerships also are fueled by a progressive approach to alternative modes of transportation like bike-sharing. In one

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prominent Bay Area example, Lyft operates the Bay Wheels bike-share service under contracts with the Metropolitan Transportation Commission and the cities of Berkeley, Emeryville, Oakland, San Francisco, and San Jose.

To gain a better sense of how recent partnerships may be ramping up, the *Bay Area Monitor* spoke with transit officials in Marin and Contra Costa counties, home to a pair of new public-private partnerships. They shared details about their expectations for improvement, and where more partnerships could occur.

The Software Option

Marin Transit and the Transportation Authority of Marin (TAM) announced a partnership with Uber in which the ride-sharing company's software began powering on-demand transit services through the Uber app on July 1 as part of the new Connect2Transit program. Basically, Uber's software integrated two existing programs that were set to expire this year: Connect (Marin Transit's on-demand shuttle van service) and Get2SMART (run by TAM to help commuters make first/last-mile connections to Sonoma-Marina Area Rail Transit stations).

The app makes it possible for riders to see a complete mobility option list, including fixed-route bus systems, on-demand Connect service, and discounts off shared rides.

The partnership will enable Marin Transit and TAM to realize cost savings, as well as expand accessibility and coverage. For example, the new service area will include a 2.5-mile radius around SMART stations in Marin.

Marin Transit planners consider the Uber app the next phase in its Connect program, which originated in 2018 with technology partner Via. During the first year of the Connect pilot, Marin Transit's planning team suggested performance targets of four passengers per hour and \$15 per passenger trip as part of the evaluation process. But it was not meeting those targets, according to a June 1 staff report.

Marin Transit officials are looking to see if they can get closer to those targets now and reach the Connect program's target ridership: older adults and people with disabilities.

"We're beginning some community outreach with senior facilities and leveraging our communication channels with partner organizations through the county," said Cody Lowe,

planning analyst at Marin Transit.

Meanwhile, TAM is offering passengers fare discount vouchers on shared rides operated by Uber's TNC driver network to and from SMART stations and other transit hubs. The rider pays an initial \$4 for UberPool, and then qualifies for a discount of up to \$5.

TAM also is partnering with local employers like Kaiser Permanente and the County of Marin, who will help subsidize rides for their employees who use the discount program when traveling to and from job centers.

Transportation agencies are "dealing with the recovery from COVID-19 and shelter in place so there's a lot of focus on being judicious with limited resources and addressing fiscal realities," said Derek McGill, planning manager at TAM, which expects to save \$20,000 and \$30,000 over the Uber contract's two-year life.

Mobility Storm

Well before the coronavirus outbreak, City of Oakley Mayor Kevin Romick said he and other Contra Costa transportation

officials were preparing for a "mobility storm," given a mass of jobs, commutes, congestion, and transit blowing in.

The question was, "How do we marry all these together to make better commute options, rather than adding more cars to our already crowded roads?" Romick said.

Oakley's City Council approved a memorandum of understanding (MOU) in May with South San Francisco-



Autonomous electric Glydcars may one day provide connecting service between different public transit systems. photo courtesy of Glydways

based Wayfarer, which does business as Glydways, to evaluate the use of Glydways' operating software. It pilots an on-demand transit system made up of small, autonomous electric "Glydcars" that travel on fixed, narrow guideways. The technology is not currently in operation, but YouTube videos show what it'll be like to ride.

Such a system is key to attracting passengers that cities and transit agencies are keen to recover, said Eliot Temple, vice president of business development at Glydways. It relies on app-based ticketing so commuters can book a car with their mobile device and then get on and off at designated boarding bays that help minimize crowding. Each passenger or group traveling together (up to four) also travels in their own Glydcar. They are wheelchair, stroller, and bike accessible,

and designed to be cleaned and disinfected hourly, or more.

The company thinks it's possible to develop a 5.78-mile system to serve Oakley's future Amtrak station and the Antioch BART station, with extensions to the under-construction Contra Costa Logistics Center. Completion of the center — expected to create 2,800 full- and part-time jobs — could occur by 2022, depending on securing tenants.

Glydways estimates its mass transit system could move 10,000 people per hour at 90 percent less than the cost of rail.

Romick said he and other officials are “conceptually thinking” the system could run on the BNSF Railway right of way — just under 12 feet is needed — and on State Route 160 to Antioch BART. The feasibility study will determine the ultimate route, Romick said.

In addition to Oakley, Glydways has MOUs with the cities of Sacramento and South San Francisco, Temple said. It's also working toward agreements with Concord, Brentwood, and Richmond with the intent of a pilot system in each jurisdiction, he said.

Interest “is reflective of how our solution meets the demand and long-overdue improvement of transit today: affordability, scalable capacity, and a genuinely socially equitable solution with a peaceful rider experience,” Temple said.

Takeaways

For all the benefits envisioned, public-private partnerships aren't without risks, according to the *21 Key Takeaways* report. For starters, agencies must accept a certain amount of trial and error, grapple with cost versus control issues, and be patient while riders adjust their travel habits.

The pursuit of innovation for innovation's sake could get the best of some agencies, too. Some programs die after their pilot phase, some of which could be attributed to a weak business plan, according to the DePaul report.

The report includes analysis that's relevant to the Bay Area, where the need to fill mobility gaps and deter driving is an ongoing challenge. Here are a few of the trends the researchers said to watch for in the next phase of TNC-agency partnerships.

First, they think agencies should pursue fare payment integration for on-demand programs, employing the trip planning and booking platforms their local transit systems use. Successful promotion involves positioning the program as a part of a larger transit system rather than a separate initiative.

Second, on-demand programs in suburban and rural areas with relatively low population densities are “quietly gaining momentum,” the report found. Cost is a driving force behind the rollout. The report cited a transit agency representative

who said its on-demand program is successful as a first/last-mile service because demand is too low to justify fixed-route service to the area.

On a cautionary note, some officials pointed to a “relative dearth of technical resources available to design effective programs in these areas,” according to the report. People also may not be as aware of transit options in car-dependent suburban and rural regions. That makes marketing a challenge.

Third, agencies will get better at evaluating partnerships based on their familiarity with available data, expanding technical capabilities of TNCs, and the sharing of information among stakeholders.

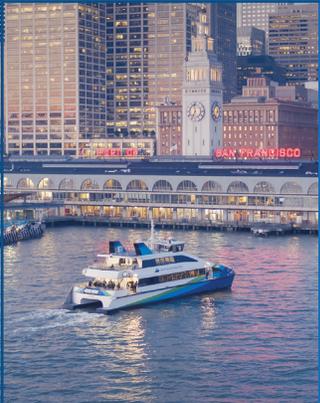
Like Marin Transit and TAM, DePaul researchers expect more agencies will turn to TNCs as a way to improve travel options for seniors and people with disabilities.

Lastly, they expect more deals. While many of the early on-demand partnerships involved smaller cities and small-to mid-size agencies, large-scale partnerships are likely to emerge and mirror trends in Europe.

In fact, TAM and Marin Transit's agreement with Uber represented the ride-sharing company's first software-as-a-service transit partnership. It's likely that deal will pave a path for more going forward, according to an article by *TechCrunch*.

“The view about the future of transit has changed dramatically as we look to a future with more flexible work schedules, and greater need for faster service,” Schwieterman said. “It positions these partnerships pretty well.” 

Cecily O'Connor covers transportation for the Monitor.



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Where's the Dirt? Scientists Surveying Sediment in Salt Marshes

By Robin Meadows

When Brenda Goeden first started working on mud, silt, and sand in the San Francisco Bay two decades ago, dredgers and contractors couldn't get rid of all the sediment they excavated fast enough. "They'd dump it in the ocean because that was cheapest," recalled Goeden, the Sediment Program Manager for the Bay Conservation and Development Commission (BCDC). But today sediment is a hot commodity, as restorationists and developers scramble to elevate salt marshes and building sites before rising tides claim them. Now, a new plan is in the works to optimize allocation of this critical resource.

"Sediment is huge," said Christina Toms, an ecological engineer at the San Francisco Bay Regional Water Quality Control Board. "Without adequate sediment, tidal wetlands will drown."

Salt marshes protect the bay shore from crashing storm waves, making these wetlands vital to preparing for sea level rise. "The bay used to be ringed by hundreds of thousands of acres of wetlands," Toms continued. "But about 90 percent have been destroyed." People began diking and filling the bay's wetlands for agriculture and urban development in the 1800s. Then, 20 years ago, bay restorationists set a goal of rebuilding 100,000 acres of tidal marsh by 2030.

So far, so good — we're about halfway there. The bay has been rich in sediment ever since the Gold Rush, when hydraulic mining eroded extensive swaths of the Sierra Nevada foothills. Winter rains washed the eroded hillsides into streams and rivers, which then carried the sediment across the Central Valley, through the Sacramento-San Joaquin Delta, and into the bay. Now, though, this extra sediment may finally be running out.

Will there still be enough to rebuild our marshes in time to keep pace with sea level rise? Restorationists aren't entirely sure because getting a handle on sediment is tricky. Take it from none other than Albert Einstein, whose son Hans Albert Einstein was a UC Berkeley professor half a century ago studying sediment transport in rivers. When asked what he thought of his son's career, the elder Einstein said, "He is

working on a more difficult problem," according to Walter Mih's 2000 biography *The Fascinating Life and Theory of Albert Einstein*.

Tracking sediment in the bay is "very hard because it's a big, complex system," BCDC's Goeden said. Sediment comes in from a range of sources besides the Sierra Nevada, including creeks that drain local watersheds as well as the ocean. Moreover, the amount of sediment coming in varies over time. "It's affected by rainfall and how fast rivers are moving," explained Jeremy Lowe, a San Francisco Estuary Institute (SFEI) scientist who has worked on tidal wetland restoration and sea level rise adaptation for 30 years. People muddy the sediment picture even further. "We dredge and move it around a lot," he added. The key to keeping tabs on sediment — and the salt marshes it nurtures — is monitoring.



Eroded scarps along the bayward edge of Corte Madera Marsh illustrate how waves, limited sediment supplies, and rising sea levels can drive shoreline retreat.

photo by Alec MacDonald

This spring marked the launch of an effort to establish tidal marsh monitoring all around the bay. "Right now monitoring is done project by project," said the San Francisco Estuary Partnership's Heidi Nutters, who is project manager of the new effort, which is fittingly called the Wetlands Regional Monitoring Program (WRMP). Other partners include SFEI, the San Francisco Bay Regional Water Quality Control Board, and the U.S. Environmental Protection Agency. "We need to close the gaps with a monitoring network throughout the region," Nutters said.

Salt marshes tend to do well in the South Bay, where 15,000 acres of former commercial salt ponds are being restored to tidal wetlands. "A lot of sediment moves around in the South Bay," the Water Board's Toms explained. "There are very extensive mudflats so a lot of sediment gets resuspended in the water and rates of natural accretion are very high." At the other end of the spectrum is Corte Madera Marsh in Marin County, which is eroding along its bay edge. "It's kind of unzipping," she said. "It's converting to unvegetated mud flat and open water." But the prospects for many marshes around the bay are unknown.

Marsh gains and losses can be measured by sticking metal

plates upright in the mud, and seeing if the plates are buried deeper or become more exposed over time. In addition, the sediment supply can be assessed in a variety of ways. For example, flow gauges in a stream yield estimates of how much sediment is delivered from a particular watershed, while turbidity sensors yield estimates of how much sediment is suspended in the water at a given spot in the bay.

“The WRMP will build a picture of sediment in the bay and how it moves around,” SFEI’s Lowe said. “Do we have enough sediment in the right place at the right time?” More comprehensive monitoring will also reveal which tidal marshes are keeping up with sea level rise on their own and which ones need help most.

“Sediment is one of the biggest dials we can turn but it’s a limited resource and is very expensive to move around,” Toms said. “Voters are investing in restoration with Measure AA’s \$25 million a year for 20 years — the WRMP will help us make decisions to get the biggest bang for the buck.”

The next step will be figuring out how to feed a sediment-starved marsh. Until now, actively rebuilding marsh has basically meant heaping sediment on former wetlands that were diked off for agriculture long ago and had subsided. The first of these was the Sonoma Baylands, 322 acres that were about six feet below sea level in the early 1990s. Filling that enormous depression took 2.8 million cubic yards of sediment dredged from the Petaluma River and Port of Oakland.

Saving an existing marsh from drowning will require considerably more finesse. “We can’t just put sediment directly on the marsh,” Lowe said. “It would fill the tidal channels and bury the plants.” The question is how to add sediment in a way that allows the marsh to live. While no one knows how to do that for sure, Lowe has some thoughts.

One possibility is putting dredged sediment in a barge and releasing it on a mudflat near the marsh. “Then we could let the waves carry it in just as they would naturally,” he said. Another is to tap the sediment that collects behind dams in local watersheds: “Could we build a big pipeline and slurry it down?” Lowe mused. However, he emphasized, for now these are just ideas on paper.

The sooner we figure out how to revitalize our tidal marshes the better. “We need to focus on the bay’s wetlands,” BCDC’s Goeden said. “The time is now for them.” 

Robin Meadows covers water for the Monitor.

Waves of Grain

By Aleta George



A key component of staples like bread, wheat is a great grain to grow in the Golden State.

photo courtesy Frog Hollow Farm

During the COVID-19 pandemic, baking has become a popular and passionate pastime for countless people sheltering in place. They might not be aware, however, that every time they measure out another cup of flour, they have a chance to support California agriculture.

Although better known for its fruits, nuts, and vegetables, the Golden State is well suited to growing grains, due to its dry summers and low humidity. Farmers here grow a variety of small grains including rice, barley, rye, oats, corn, and wheat — especially hard wheat, the type primarily used for making bread. Now, with demand for grains soaring as home oven use goes into overdrive, it’s worth looking at how local grain cultivators are getting their products — and their land stewardship practices — into the mix.

Fritz Durst of Tule Farms is a fifth-generation farmer with a large grain-growing operation about 90 miles northeast of San Francisco. Durst grew up farming alongside his father and grandfather, and remembers his grandpa bringing grain to his grandmother, who ground it into flour in a little hand-grinder to make bread. “That’s the way America ate,” he said.

That has changed, along with Durst’s farming practices. “When I grew up, we were heavy into tillage. And that brought with it, many, many problems,” said Durst. “Soil erosion was the worst. We had really goofed up the soil in two ways. Number one, we disrupted the soil biology, and number two was that we eliminated a lot of organic matter in the soil. We learned that the reason our soil was hard was because of some of the practices we were doing.”

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Waves of Grain (from page 9)

In the mid-1980s, Durst convinced his father to stop tilling, and today 85 percent of his dryland acres are no-till. At seeding time, Durst plants seeds on top of the two-foot-tall stubble leftover from the previous year. “By using a no-till process, we minimize erosion,” said Durst. “We used to lose tons of soil per year. Today, with no-till, I might lose two tenths of a ton instead of five or six tons per year. And I can absorb, I would bet, three times as much water on a given rainstorm as I could the old farming way.”

No-till is part of conservation tillage, said Durst, which he practices on 90 percent of all his soil. Conservation tillage means that, along with growing crops, a farmer aims to improve air, water, and soil quality, and reduce carbon emissions. Carbon in the soil is good; it is used by the plants. But tilled soil releases the carbon into the air where it combines with oxygen and makes carbon dioxide, a greenhouse gas.

Durst used to love the smell of freshly plowed soil until he came to realize that the smell meant carbon dioxide.

Another advantage to conservation tillage is supporting wildlife, which is attracted to the abundant life that comes with healthy soil. “I see animals that I never saw out here when I was younger. Just the other day I saw a couple of road runners, and I see coyotes every day,” he said. “It’s very encouraging when I see all those animals out there in the morning or late evening. It’s kind of the reason that I want to get up tomorrow and go to work again.”

Durst farms about 2,400 acres on mostly leased land, which is a lot of acreage for grain by California standards, but not a lot compared to acreages in other states where production costs are lower, land and water are cheaper, and workers are paid less. California imports more wheat than it grows, and mills more wheat than any other state in America, with a daily capacity of over 12 million tons according to the California Wheat Commission. Three of the largest mills in California are in or near the Bay Area: Miller Milling in Oakland, Giusto’s in South San Francisco, and Ardent Mills in Stockton.

“Most of the wheat that comes through the mills in California

is coming from the Midwest and the upper Midwest,” said Mark Lundy, a UC Davis agronomist and small grain specialist.

“Efficiencies of scale really play out in the grain markets,” he said. To illustrate, he compared wheat to a tomato. When a tomato is on your plate, it looks pretty much like it did in the farmer’s field. But a field of wheat goes through many steps to become bread. The grain is harvested, winnowed, milled, and

mixed, and each of these steps have become specialized and segmented to help lower costs. “Over time, we’ve evolved systems that tend to favor large-scale processing, whether that’s a big combine moving through a field, a big silo storing it, or a mill grinding it into flour,” said Lundy.

However, there are also small mills to accommodate the local heirloom grain market, such as Capay Mills in the Capay Valley northwest of Sacramento. “The difference is the scale,” said Lundy. “That kind of specialty market

is somewhat removed from the larger-scale market that is providing bread for the majority of the population.”

Many in the Bay Area have an appetite for, and the willingness to pay for, locally grown heritage grains, such as Cindy Pappas in Benicia, who in her retirement bakes artisan bread every day. She says heritage grains are “good gut stuff, and flat-out better for your body.” Interest in heritage grains has created a niche market that supplies product for chefs and home cooks who want to know where their grains are coming from. Durst has tapped into that market, and in addition to growing grain for the large-scale wheat market at a price that is globally determined, he grows organic Patwin and Summit wheat for Oakland’s Community Grains, whose mission is to “restore a vibrant local grain economy in California.”

Other local sources for specialty grains include Brentwood’s Frog Hollow Farm, which is currently selling a limited amount of white Sonora wheat flour, a heritage grain that was the primary type of wheat grown in Northern Mexico and the American West for 200 years. Frog Hollow planted white Sonora wheat last winter on land slated to become a new nectarine orchard this year. Wheat is a good winter crop to cover the soil, foster microbial growth, combat erosion, serve as a disease break,



Honoré Farm & Mill has been growing Hourani wheat — which takes on a temporary bluish tint — in Healdsburg. photo courtesy Honoré Farm & Mill

and absorb water. “Keeping the above ground covered and the below ground filled with roots is super important to us,” said farm assistant Rachel Sullivan. The rain-fed crop yielded 22 tons of wheat berries, of which they sold 13 tons to Berkeley’s Acme Bread, five tons to Capay Mills, and kept the rest to sell to small bakers and through their online webstore and CSA program.

Honoré Farm & Mill also grows organic wheat, but they have a higher calling: to re-connect people to land and community. Agricultural chaplain Elizabeth DeRuff, the founder and president of the nonprofit, said they are in their sixth year of planting wheat. Each year, they plant and harvest a crop of wheat with volunteers on donated land. This year’s crop is being grown on one-eighth of an acre at HomeFarm in Healdsburg.

DeRuff is excited for the August harvest of Hourani wheat, grown from seeds donated by the University of Washington’s Bread Lab. Hourani wheat seeds had been stored by King Herod 2,000 years ago in the Masada Fortress in the Middle East’s Fertile Crescent until they were discovered and excavated. The Hourani in the Honoré plot had a bluish tint before it turned golden brown. “I can’t tell you how beautiful this wheat is,” said DeRuff.

“[Wheat] is a really robust, adaptable crop,” said Lundy. “That’s why we’ve seen it grown all over the world and support so many civilizations.”

Honoré will harvest the wheat in August, and although this year’s harvest day will look different due to the pandemic, in the past about 65 people gathered to harvest and share a meal with bread baked from the previous year’s harvest. “We all have farming in our ancestry, and there’s something ancient about harvesting by hand. Without fail, someone will burst

into tears,” said DeRuff.

Honoré also provides flour to Episcopal churches so that they can bake healthful communion bread for their services. DeRuff once tracked a communion wafer, and found that the grain had travelled 4,500 miles. For her, that didn’t square with what was supposed to be the “bread of life.”

“I’m most interested in a community gathering for harvest, which is how it used to be done,” said DeRuff. “People would help each other harvest their grain, or whatever their crops were. Before refrigeration, before Costco and supermarkets and all of that, what you grew was your life. When famine hit, people died — it is not like there’s a few baking ingredients missing on our shelves. So, the connection between the people of a community and the land upon which people were farming was very, very close. People looked at that crop, and realized, my life is dependent upon that crop.”

It hasn’t always been easy to source local grains — until now. At the end of August, the California Wheat Commission is launching goldenstategrains.com, a new website that will help bakers, millers, and brewers find grain. Director Claudia Carter stated in a letter to participants that she hopes the site will expand markets for growers and “build California grain as a brand.”

Leyna Lightman, a core organizer in the California grain movement, commented about the launch that “this site has the potential to change the landscape for California grain and to better equip everyone involved in our grain community to thrive.” Now that’s something to sink your teeth into. 

Aleta George covers open space for the Monitor.



East Bay
Regional Park District
Healthy Parks Healthy People

Keeping Parks Open During COVID-19

Working with the County Health Officers, the Park District has kept parks open for physical and mental wellbeing. We thank the public for their cooperation and understanding during these stressful times as we balance the public’s need for parks, public health, and the health and safety of our employees. Please wear a face covering while in our parks...for you, for others, and for our employees.

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COVID-19 VISITOR INFORMATION

Social Distancing Requirements:

- Maintain six-foot distancing from other guests
- Cover coughs and sneezes with elbow or tissue (no hands)
- Do not shake hands

Visitor Tips:

- Wear a Face Mask or Cloth Tissue collection is provided
- Bring Hand Sanitizer (Antiseptics not allowed)
- Bring Water (Water fountains are available)

Visit www.eastbay.org for more info.

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