

Illegal pot grows continue despite change in law

By Peter Fimrite, San Francisco Chronicle

The legalization of cannabis in California has done almost nothing to halt illegal marijuana growing by Mexican drug cartels, which are laying bare large swaths of national forest in California, poisoning wildlife, and siphoning precious water out of creeks and rivers, U.S. Attorney McGregor Scott said Tuesday.

The situation is so dire that federal, state and local law enforcement officials are using \$2.5 million from the Trump administration this year to crack down on illegal growers, who Scott said have been brazenly setting booby traps, confronting hikers and attacking federal drug-sniffing dogs with knives.

Instead of fading away after legal marijuana retail sales went into effect this year, the problem has gotten worse, according to Scott, who was joined in a news conference Tuesday in Sacramento by California Attorney General Xavier Becerra and other federal forestry and law enforcement officials.

Read the whole story

Calif. moves a step closer to net neutrality

By Levi Sumagaysay, Bay Area News Group

The California State Senate on Wednesday approved a net

neutrality bill that has been called the “gold standard” of such bills in the nation, as states grapple with a controversial repeal of Obama-era federal rules meant to ensure an open internet.

The state senate voted 23 to 12 to adopt SB 822, the bill by State Sen. Scott Wiener, D-San Francisco, in another rebuke to the Trump administration on this issue.

The majority-Republican Federal Communications Commission, led by Chairman Ajit Pai, who was named to his position by President Trump, repealed the 2015 Open Internet Rules in December. Pai said the net neutrality rules amounted to government overreach and hurt broadband investment.

Read the whole story

Vacation searches up, signaling strong economy

By Fred Imbert, CNBC

The U.S. economy seems to be on solid footing, according to one unusual indicator: vacation searches on the internet.

Google searches for the term “vacation” rose 10 percent in April on a year-over-year basis, said Nicholas Colas, co-founder of DataTrek Research, using Google Trends data.

This is positive for the U.S. economy, Colas said, as U.S. workers are usually reluctant to take time off from work.

Read the whole story

Mayors are advancing climate-friendly policies

By Nicolas Gunkel, The Conversation

Leadership in addressing climate change in the United States has shifted away from Washington, D.C. Cities across the country are organizing, networking and sharing resources to reduce their greenhouse gas emissions and tackle related challenges ranging from air pollution to heat island effects.

But group photos at climate change summits typically feature big-city Democratic mayors rubbing shoulders. Republicans are rarer, with a few notable exceptions, such as Kevin Faulconer of San Diego and James Brainard of Carmel, Ind.

Faulconer co-chairs the Sierra Club's Mayors for 100 Percent Clean Energy Initiative, which rallies mayors around a shared commitment to power their cities entirely with clean and renewable energy. Brainard is a longtime champion of the issue within the U.S. Conference of Mayors and the Climate Mayors network.

In our research at the Boston University Initiative on Cities, we found that large-city Republican mayors shy away from climate network memberships and their associated framing of the problem. But in many cases they advocate locally for policies that help advance climate goals for other reasons, such as fiscal responsibility and public health. In short, the United States is making progress on this issue in some surprising places.

Climate network members are mainly Democrats

In our initiative's recent report, "Cities Joining Ranks," we systematically reviewed which U.S. cities belong to 10 prominent city climate networks. These networks, often founded by mayors themselves, provide platforms to exchange information, advocate for urban priorities and strengthen city governments' technical capacities.

The networks we assessed included Climate Mayors; We Are Still In, which represents organizations that continue to support action to meet the targets in the Paris climate agreement; and ICLEI USA.

We found a clear partisan divide between Republican and Democrat mayors. On average, Republican-led cities with more than 75,000 residents belong to less than one climate network. In contrast, cities with Democratic mayors belonged to an average of four networks. Among the 100 largest U.S. cities, of which 29 have Republican mayors and 63 have Democrats, Democrat-led cities are more than four times more likely to belong to at least one climate network.

This split has implications for city-level climate action. Joining these networks sends a very public signal to constituents about the importance of safeguarding the environment, transitioning to cleaner forms of energy and addressing climate change. Some networks require cities to plan for or implement specific greenhouse gas reduction targets and report on their progress, which means that mayors can be held accountable.

Constituents in Republican-led cities support climate policies

Cities can also reduce their carbon footprints and stay under the radar – a strategy that is popular with Republican mayors. Taking the findings of the "Cities Joining Ranks" report as a starting point, I explored support for climate policies in Republican-led cities and the level of ambition and transparency in their climate plans.

To tackle these questions, I cross-referenced Republican-led cities with data from the Yale Climate Opinion maps, which provide insight into county-level support for four climate policies:

- Regulating carbon dioxide as a pollutant
- Imposing strict carbon dioxide emission limits on existing coal-fired power plants
- Funding research into renewable energy sources
- Requiring utilities to produce 20 percent of their electricity from renewable sources.

In all of the 10 largest U.S. cities that have Republican mayors and also voted Republican in the 2008 presidential election, county-level polling data showed majority support for all four climate policies. Examples included Jacksonville, Fla., and Fort Worth, Texas. None of these cities participated in any of the 10 climate networks that we reviewed in our report.

This finding suggests that popular support exists for action on climate change, and that residents of these cities who advocate acting could lobby their elected officials to join climate networks. Indeed, we have found that one of the top three reasons mayors join city policy networks is because it signals their priorities. A mayor of a medium-sized West Coast city told us: “Your constituents are expecting you to represent them, so we are trying politically to be their voice.”

Climate-friendly strategies, but few emissions targets

Next I reviewed planning documents from the 29 largest U.S. cities that are led by Republican mayors. Among this group, 15 have developed or are developing concrete goals that guide their efforts to improve local environmental quality. Many of these actions reduce cities’ carbon footprints, although they are not primarily framed that way.

Rather, these cities most frequently cast targets for achieving energy savings and curbing local air pollution as part of their master plans. Some package them as part of dedicated sustainability strategies.

These agendas often evoke images of disrupted ecosystems that need to be conserved, or that endanger human health and quality of life. Some also spotlight cost savings from designing infrastructure to cope with more extreme weather events.

In contrast, only seven cities in this group had developed quantitative greenhouse gas reduction targets. Except for Miami, all of them are in California, which requires its cities to align their greenhouse gas reduction targets with state plans. From planning documents it appears that none of the six Californian cities goes far beyond minimum mandated emission reductions set by the state for 2020.

Watch what they do, not what they say

The real measure of Republican mayors taking action on climate change is not the number of networks they join but the policy steps they take, often quietly, at home. While few Republican mayors may attend the next round of sub-national climate summits, many have set out policy agendas that mitigate climate change, without calling a lot of attention to it – much like a number of rural U.S. communities. Focusing narrowly on policy labels and public commitments by mayors fails to capture the various forms of local climate action, especially in GOP-led cities.

Carmel, Ind., Mayor James Brainard has suggested that some of his less-outspoken counterparts may fear a backlash from conservative opinion-makers. “There is a lot of Republicans out there that think like I do. They have been intimidated, to some extent, by the Tea Party and the conservative talk show hosts,” Brainard has said.

Indeed, studies show that the news environment has become increasingly polarized around accepting or denying climate science. Avoiding explicit mention of climate change is enabling a sizable number of big-city GOP mayors to pursue policies that advance climate goals.

Nicolas Gunkel is a research fellow at Boston University Initiative on Cities, Boston University.

Tennis pro takes over Whittell High PE class



Dave Nostrant, right, instructs Whittell High students in the fundamentals of tennis. Photo/Ross Rittiman

By Kathryn Reed

ZEPHYR COVE – Physical education class isn't just running laps or fulfilling some state mandate. For students in Emily Hunter's class at Whittell High School it's about learning

skills that will last a lifetime.

For the past three weeks this group of freshmen and sophomores has been running from campus down to Zephyr Cove Tennis Club where head pro Dave Nostrant has been providing them with free instruction.

At first Hunter just wanted some court time, but Nostrant offered to coach the teens at no cost. He even provided rackets for them to use.

Nostrant said it took a bit of time for the kids to get interested in the sport, but as their skills improved, their enthusiasm level increased. Introducing more young people to tennis is something Nostrant has been trying to do since he took over the instruction at ZCTC a year ago.

"We've been able to do mini doubles where I hit a ball to a doubles pair and they play out the point," Nostrant said of the high school students.

Catalina Wilson was enjoying being outside and not stuck in the gym. While she has played before, she's not sure how much she'll play in the future because it takes a lot of work.

For Lydia Otterstron she liked learning all the strokes, with forehand her favorite because she said it was the easiest.

All are beginners even though a couple have been on a tennis court before. By the end of the class they will have been taught a forehand, backhand, volleys on both sides, and serve, as well a little bit about grips, the lines and different places on the court.

"I'm a big believer in lifetime sports," Hunter told *Lake Tahoe News* as she watched her students learn to serve. "When they leave my class they have skills. Tennis is something you can do for the rest of your life."

EDC supe candidate spews hatred, bigotry

By Kathryn Reed

A business with the same SS logo used by the Nazis, posing with the Confederate flag and using it in another business, slamming gays and immigrants, saying there is no such thing as a transgender, and belonging to an outlaw motorcycle gang.

The above describes one of the candidates on the June 5 ballot for District 5 El Dorado County supervisor.

Kenny Curtzwiler is divisive for a lot of reasons. Often it's not about his dark side, but more his assertions about myriad topics of which he professes to be well-versed but is often ill informed. *Lake Tahoe News* had to stop publishing his comments years ago when South Tahoe Public Utility District was his pet target because it required a correction nearly every time he hit send.



Ken Skibum Curtzwiler Well, I am from SOUTH Lake Tahoe



There was a time when Curtzwiler's Facebook page was full of hate. Much it has been scrubbed, but there are still inflammatory opinions there. It

is his right to believe what he wants and to even write what he wants when it's opinion and not stated as fact. It is also the public's right to know as many facets of a candidate as possible.

A Facebook post from Feb 3, 2017, says, "If the Black Panthers can have an exhibit celebrating their heritage in Oakland why can't the Confederates have an exhibit celebrating their heritage in South Lake Tahoe?? Don't get your panties in a bunch people, it's just a question?"



Ken Skibum Curtzwiler shared Patton Tank's American BadAss's post.
5 hrs · 🌐



Another post (date unknown) Curtzwiler posted a Fox News link with the headline "Democratic Rep. Frederica Wilson: White House 'is full of white supremacists.'" Curtzwiler wrote: "Ok. I can live with that."

This is the same person who when unsuccessfully running for supervisor in 2014 defended having said, "Yes I do collect unemployment on your dime and enjoy every powder day and have

absolutely no regrets or ashamed of what I do.”

Curtzwiler works during the summer, then collects unemployment in the winter to help fund his “ski bum” lifestyle. At the time he told *LTN* in defense of his actions, “My company is a corporation and I am an employee of the company. I receive a paycheck and pay into EDD.”

This philosophy is in conflict with other posts on Facebook where he told someone to give up their citizenship and become an immigrant so they’d get kickbacks from the government faster.



From the Brotherhood motorcycle gang’s Facebook page.

On May 23 Curtzwiler emailed *Lake Tahoe News* stating, “I understand there are some questions being raised about my affiliation with a certain club. Rather than go through third parties you can ask me and if I feel the question is relevant rather than looking for dirt I will answer it.”

He could only have been alerted to this fact from the South Lake Tahoe Police Department because that is the only entity this reporter called regarding Curtzwiler’s affiliation with the Brotherhood motorcycle group.

The Brotherhood on its Facebook pages calls itself part of the 1 percenters. This designation, according to Police Chief Brian Uhler, puts them in the same category as the Hells Angels. Uhler also called the Brotherhood a gang.

While the local cops have not had any issues with members of the Brotherhood for a few years, drugs and assaults are part of their past.

Curtzwiler, according to Uhler, claims not to be part of the gang anymore. But with most gangs it's not possible to just walk away. In other words, once a member always a member even if you don't fly the colors.



Kenny Curtzwiler

Lake Tahoe News on May 27 emailed Curtzwiler a series of questions with the deadline being May 29. No response.

Here are the questions:

1. *When did you first join the Brotherhood motorcycle group and why?*
2. *What is your affiliation with them now?*
3. *This is a self-described 1% motorcycle gang. The police describe it as a gang. Comment?*
4. *On social media you have posed with a Confederate flag and have one of your Ski Bum logos as a Confederate flag. Why?*

What are you trying to say? Most people see this as a symbol of racism. Do you? Why or why not?

5. On social media you have supported white supremacists, the KKK and Nazis. Why?

6. Your former business Lake Tahoe Custom Cycles had a logo of two S's. The same logo as the Nazi Schutzstaffel, better known as the SS, of which the Gestapo was part of. Any comment?

7. On social media you have come out against gays and have said there is no such thing as a transgender. Why do you have hatred toward these people?

8. Why are you against immigrants?

9. How do you believe someone with such hatred toward so many groups of people will be able to represent those same people?

10. Why all the hatred?

Curtzwiler in 2012 and 2017 applied for a concealed weapons permit with the El Dorado County Sheriff's Department. He was denied both times.

"Sorry, that information is not releasable," Lt. Bryan Golmitz told *Lake Tahoe News* when asked why Curtzwiler was not given the permit.

Feds have long treated Nev.

as a dumping ground

By Michael Green, The Conversation

Nevadans can be forgiven for thinking they are in an endless loop of “The Walking Dead” TV series. Their least favorite zombie federal project refuses to die.

In 2010, Congress had abandoned plans to turn Yucca Mountain, about 100 miles northwest of Las Vegas, into the nation’s only federal dump for nuclear waste so radioactive it requires permanent isolation. And the House recently voted by a wide margin to resume these efforts.

Nevada’s U.S. Sens. Dean Heller, a Republican, and Catherine Cortez Masto, a Democrat, have made their determination to block the latest Yucca proposal clear since the Trump administration first proposed resurrecting the project in early 2017.

While teaching and writing about the state’s history for more than 30 years, I have followed the Yucca Mountain fight from the beginning – as well as how Nevadans’ views have evolved on all things nuclear. The project could well go forward, but I believe that it probably won’t as long as there are political benefits to stopping it.

The roots of statewide resentment

Two-thirds of Nevadans oppose this plan, according to a 2017 poll. The state’s experience with federal actions, including nuclear weapons and waste, may help explain the proposed repository’s long-standing unpopularity.

When Nevada became a state in 1864, it had to cede all claims to federal land within its boundaries. This left the federal government owning more than 85 percent of the state, reducing its potential tax base, and angering ranchers who have chafed

at federal controls and fees for grazing their livestock ever since.

In 1873, the U.S. adopted the gold standard, reducing the value of silver – large amounts of which came from Nevada, known as the “The Silver State.” After the “Crime of ’73,” Nevadan state leaders dedicated themselves to restoring silver as an anchor of monetary policy, to no avail.

A series of boom-and-bust cycles ensued. Nevadans sought other means of prosperity, including some that other states shunned. In 1897, for example, Nevada hosted a world heavyweight boxing championship when other states refused.

That decision and the state’s declining population prompted the *Chicago Tribune* to suggest revoking Nevada’s statehood. Similar calls cropped up over Nevada’s permissive divorce and gambling laws.

A magnet for federal projects

Tourism, however, became central to Nevada’s economy. So did federal projects, like Hoover Dam, which enabled Southern Nevada to obtain most of the water it needs to survive.

World War II and the Cold War prompted numerous federal projects that benefited southern Nevada. A wartime gunnery school evolved into Nellis Air Force Base, and a magnesium plant led to the founding of the city of Henderson.

In 1951, seeking a cheaper domestic location for nuclear tests and research, the Atomic Energy Commission chose part of Nellis. Until 1963, the Nevada Test Site was the scene of about 100 aboveground atomic tests, with more than 800 additional underground tests to follow until nuclear testing ceased in 1992.

When aboveground testing began, Nevada cashed in. The governor welcomed the chance to see the desert “blooming with atoms.”

Las Vegas marketed the mushroom cloud as a tourist attraction, as well as an atomic hairdo and cocktail. Atomic Energy Commission pamphlets and videos declared the tests to be harmless to those living nearby.

Distrusting government

After learning more about the health dangers associated with nuclear fallout, Nevadans began to trust the government less. Repeated leaks and safety issues at the nation's first low-level nuclear waste dump, opened in 1962 in Beatty, eventually led to its closure in 1992.

Distant nuclear incidents also stoked concerns. The nation's worst nuclear accident to date at the Three Mile Island plant in Pennsylvania, as well as the Soviet Union's Chernobyl meltdown, rang alarm bells.

Separately, some rural Nevadans came to resent federal regulations overall, especially after the federal government increased the Bureau of Land Management's regulatory powers in the mid-1970s. Their Sagebrush Rebellion sought state control over almost all federal lands within Nevada's borders and spread throughout the rural West.

The 'Screw Nevada' bill

As nuclear testing waned, the federal government scrambled to find somewhere to stow the spent fuel from nuclear power plants that had piled up in 39 states. In 1982, Congress approved a plan for the consideration of sites in Washington, Texas and Nevada.

But five years later, without getting conclusive findings based on those studies, lawmakers voted to consider only one site – Yucca Mountain, about 20 miles west of the dump for less- radioactive nuclear waste in Beatty. The state's leaders and pundits protested this "Screw Nevada" bill, which they ascribed to the state's lack of political clout.

Around that time, Nevada created a new state agency to deal with nuclear issues and a state commission charged with warding off nuclear waste. A bevy of new state laws made it harder for federal officials and private contractors to obtain and pay for licenses needed for work on Yucca Mountain, and the state filed numerous lawsuits.

Sena. Harry Reid, a Democrat first elected in 1986, crusaded against the measure. So did his Nevada colleagues in Congress.

To make their case, Nevadans pointed out the safety risks in moving nuclear waste along highways and railroads to their state, and how terrorists might take advantage of that opportunity. They cheered when a "West Wing" episode zeroed in on these dangers.

Reid eventually moved up through Senate ranks as one of the nation's most powerful lawmakers, serving as the majority and minority leader. When former President Barack Obama took office and had to depend on Reid's help, he ended funding for Yucca Mountain.

What to expect this time

Obama and Reid are no longer calling any shots, and Nevada's congressional delegation is more junior than it's been in decades. The overwhelming bipartisan vote in the House suggests that Democrats may be less interested in protecting Nevada than they were when Reid had so much power in the Senate.

But Heller is up for re-election this year, and his is one of the few Republican Senate seats that Democrats feel confident that they can win in the 2018 mid-terms.

If Senate Majority Leader Mitch McConnell decides that enabling Heller to claim that he saved Nevada from hosting the nation's nuclear waste will help re-elect him, protecting the GOP's slim majority, I think Yucca Mountain will be dead

again. At least for the moment.

Michael Green is an associate professor of history at UNLV.

Nevada Supreme Court to rule on Walker River

By Daniel Rothberg, Nevada Independent

In 1902, a rancher by the name of Henry Miller – known as the “Cattle King of the West” – brought a lawsuit against Thomas B. Rickey, a Nevada farmer, through his Miller & Lux land company. The issue was water rights on the Walker River, and the fight between the rival ranchers set up more than a century of litigation over a waterway that originates at the edge of Yosemite National Park in California and flows through Nevada to its terminus, Walker Lake.

The case ended in 1919 with the “Rickey Decree,” which split the river among 151 users.

But that decree spawned a new case in 1924, when the federal government moved to establish water rights for the Walker River Indian Reservation. That docket remains active to this day, and last week, the 9th Circuit Court of Appeals issued a ruling that places a key water rights issue before the Nevada Supreme Court. The question is whether the state, under what is known as the “public trust doctrine,” could reallocate water rights to restore the ecology of Walker Lake even if doing so could harm the existing water rights of upstream farmers and ranchers. The public trust doctrine dates back to the Roman legal system, and it states that governments have a responsibility to preserve and protect natural resources for

the public.

Read the whole story

Opinion: Shroud of secrecy envelops S. Lake Tahoe

By Kathryn Reed

Public Records Act requests sent to the city of South Lake Tahoe seem to disappear into a dark hole that never see the light of day.

It is the city clerk, Suzie Alessi, who is responsible for responding to them. She is an elected official who is only answerable to the residents. Her seat will be on the November ballot. In the past she has said this would be her last term. Let's hope she keeps her word since she doesn't do her job well.

According to the city's website, "The city clerk oversees, promotes and encourages open and participatory government."

It's what the position is supposed to do. It's the opposite of what is going on today.

Alessi doesn't actually have to show up for a regular 9am-5pm, Monday-Friday workweek. And she doesn't. She comes and goes as she likes. No one knows when she might show up. She takes extended leaves. If she shows up in some inappropriate state, there is no one to tell her to go home, no one to discipline her.

If she doesn't do her job, there are no consequences. The

media or another entity could sue to get the public records. The city would then be liable for those attorney fees if it were to lose.

Lake Tahoe News has asked for a variety of records. In early April *LTN* sought text messages. The last correspondence from Alessi was on May 3 when she wrote, "Estimated date of completion is middle to end of next week."

Still no records.

Then *LTN* started investigating the theft of Councilmember Austin Sass's iPhone 7 and iPad Air 2. He told police they were stolen from his vehicle on the morning of April 6. The car was parked in front of St. Theresa Church, where his wife works. The vehicle was not locked.

Sass called the police chief, who then let dispatch know. Sass left the church even though the officer arrived seven minutes after being notified. The councilman was tracked down at the gym where he works out.

The city's IT department tried to track the devices, but they were turned off. Why carry them, if you can't be reached? Why not just have them on silent if you don't want to be disturbed?

There is no proof they were actually taken from the vehicle. With the devices deliberately turned off, it meant they could never be traced. iPhones when turned on can be found even from another phone.

The devices went missing just as Sass was asked to turn them in because of multiple PRAs. The timing is suspicious.

According to the city's Information Security Policy, "All messages created, sent, or retrieved over the internet are property of the city of South Lake Tahoe."

Police Chief Uhler was asked why on the police report it says

the case is closed. Uhler told *Lake Tahoe News*, "A lack of investigative leads routinely leads to closing cases. Attempts to 'ping' or use device locating didn't pan-out in terms of finding the devices. Lastly, just because it is closed at this moment in time, doesn't mean we cannot open the case in the event we receive investigatory information or catch some thief with the device in his/her possession."

The city has a phone and IT policy of which at least staff is to follow.

Tom Stuart, human resources director, was brought into the conversation by Uhler.

On May 3, *LTN* asked Stuart these questions:

- *The cell phone policy says employee cell phone bills will be monitored by department heads. Does anyone monitor the calls of City Council members?*
- *Do any other elected officials have city issued cell phones?*
- *How many employees have city issued phones; and may I please get those numbers by department? Same for tablets and laptops?*
- *What is the cost to the city on an annual basis for electronic devices in terms of hardware, and then service plans?*
- *Will Austin Sass have to pay for his devices to be replaced or will the city? If the city, what is the cost?*
- *Do council members ever get copies of both of the (IT policy) documents? Do they have to sign anything that says they read it and agreed with it?*
- *It says email messages will be deleted after 45 days. Are they backed up on a server for a longer period of time?*

How long?

· *What is the threat of confidential information that would have been on Sass's devices from being accessed? Is the city concerned about what was on the devices?*

· *Is there a way to have the manufacturer prevent the devices from being accessible? Are these Apple or some other brand?*

· *And what kind of data was on the phone that could be accessed by whoever has the devices? Email? City documents? Anything confidential?*

· *Are the devices insured?*

On May 8, Stuart said, "I have forwarded your questions to Susan Alessi for response."

The questions had also been sent to acting City Manager Jeff Meston.

Naturally, Alessi has not responded. Legally, she has 10 days to respond. There are exceptions, but the person requesting the records is supposed to be notified why the 10-day limit will be exceeded. That didn't happen in this case.

Most of these questions are pretty straight forward and have no business falling under the category of a Public Records Act request.

The delay by Alessi is suspicious as well. How is anyone to know if she deletes documents that would be less than flattering to her?

This city is so incredibly screwed up. It's time to clean house. It's time to elect responsible people to all the positions. It's also time to think about no longer having an elected city clerk, after all, most cities don't.

Military prosthetic technologies benefit more than vets



The Luke Arm is revolutionary.
Photo/U.S. Department of Defense

By Mark Geil, The Conversation

In 1905, an Ohio farmer survived a railroad accident that cost him both of his legs. Two years later, he founded the Ohio Willow Wood company, using the namesake timber to hand-carve prosthetic limbs. The company grew, surviving the Great Depression and a fire that destroyed the plant, and still thrives today in rural Ohio. Few who work there now might remember the curious footnote in the company's history that occurred during World War II, when the rebuilt factory was diversified to build parts for PT boats and B-17 bombers.

Today, it is ironic to consider a company that specializes in prosthetic limbs building parts for the war machine that

unfortunately increases demand on companies making prosthetic limbs. Indeed, the tragedy of war has pushed prosthetics researchers to work ever harder to help service members and veterans who have lost limbs.

Not only are soldiers losing limbs from IEDs; older veterans are losing limbs from diabetes and vascular disease. Mobility is key to long-term health, and prosthetic limbs are key to mobility.

That has made the U.S. Department of Veterans Affairs a key player in prosthetics development and technological innovation. But what is created for service members and veterans has benefits far beyond them, helping nearly 2 million Americans – civilian children, elderly people and young adults with amputations – maximize their mobility.

A key funding source

As a biomedical engineer specializing in prosthetics, I've reviewed grant proposals seeking funding from the VA to research prosthetic limbs for several years.

The federal government has long played a vital role in advancing prosthetic technologies. Before the 1980s, prosthetic feet were adequate for standing and walking, but very limited for more intense activities involving running and jumping. Veterans Administration Rehabilitation Research and Development funds were used to develop the Seattle Foot. That device and its carbon-fiber contemporaries paved the way for "blade"-style prostheses seen in the Paralympics.

Decades later, defense-related government spending continues to drive innovation in prosthetics. The Defense Advanced Research Projects Agency has gained attention with the "Luke Arm," named after a certain fictitious Mr. Skywalker, and headlines that read like they're actually from Star Wars: "DARPA Helps Paralyzed Man Feel Again Using a Brain-Controlled Robotic Arm."

For prosthetics researchers, funding from traditional sources such as the National Institutes of Health and the National Science Foundation has become remarkably difficult to obtain, at least in part because of competition. Consequently, many researchers have turned their attention to soldiers and veterans. In 2014-15, the Congressionally Directed Medical Research Program funded 18 proposals in Orthotics and Prosthetics Outcomes. But that funding is getting more competitive too: 98 proposals were rejected.

Connecting with the body

All this work is, generally speaking, focused on transforming a prosthesis from an external tool used by a person to an integrated replacement that becomes a part of a person. Much of the research involves taking small steps toward reproducing the grand complexity and robust design of human anatomy. We have not yet achieved the flashy and functional capability of a real-life Luke Skywalker with cranial nerves attached directly to motors in a robotic hand. But researchers have made important progress through intermediate steps.

A process called targeted muscle reinnervation can connect nerves carrying messages from the brain, like “close hand,” to a muscle over which a set of electrodes are placed. Those electrodes in turn send the signal to the motorized hand to close. Sensory feedback is being developed in a similar manner. While these efforts are not yet ready for everyday community use, they represent crucial progress.

Consider also a CDMRP-funded project at the Rehabilitation Institute of Chicago and Vanderbilt University. The lower-limb prostheses used are not just passive spring-like materials: They’re active, motorized joints. Motors require careful control, and the project headed by neuroengineering specialist Levi Hargrove has attempted to learn from the amputee’s muscles when she wants to transition from walking to, say, walking up stairs or down a ramp. Just like your phone’s voice

recognition better understands your voice over time, Hargrove's control algorithm allows the motorized prosthesis to make fewer errors in ambulation.

Clearly, projects like Hargrove's stand to benefit much broader populations than just soldiers and veterans. My own research focuses on children with limb loss, and I see so-called "civilian spinoffs" every day. In our Center for Pediatric Locomotion Sciences at Georgia State University, we're modeling the material and structural properties of pediatric prosthetic feet. Many of those components can be traced back to that original VA-funded Seattle Foot. Across town at the Shepherd Center, a renowned hospital specializing in brain and spinal cord injury, robotic exoskeletons help paralyzed individuals move their limbs and remap neural pathways, a project with connections to VA prosthetic research.

Though they won't get the public recognition of the Jeep or GPS, these civilian spinoffs from military-funded research in prosthetics will have long-term benefits for people of all ages, and they'll feel the results every day.

Mark Geil is a professor of kinesiology and health at Georgia State University.