Parking & Transportation Services Sustainability and Environmental Initiatives

University of Minnesota - Twin Cities (January 2020)





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Introduction

As a long-time leader in the areas of waste abatement, pollution reduction, energy management, and sustainable architecture, the University of Minnesota has demonstrated and continues to build upon a strong commitment to environmental responsibility.

Embracing the policies of the larger university, Parking & Transportation Services has consistently demonstrated foresight and innovation in developing programs that alleviate traffic congestion, reduce emissions from automobiles and buses, and reduce fuel consumption. Since the 1980s, PTS has consistently promoted the use of alternative forms of transportation other than the personal car — walking, biking, carpooling, busing. By demonstrating the success of our programs, PTS has set an example for academic institutions and municipal entities throughout the state.

The University of Minnesota Twin Cities campus is the third largest traffic generator in Minnesota. It is the duty of the University, as Minnesota's largest academic institution, to take a leadership role in encouraging environmental responsibility on a statewide level. The University is committed to advancing the public good and improving the human condition.

Recognition of Program Excellence

See Appendix 1 for more detailed Award/Recognition information



Transportation Design System Initiatives

Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) transmits data between infrastructure devices and vehicles. The University uses various ITS to provide traffic congestion relief and to preference multi-occupany vehicles, like buses. Dynamic Message Signs (DMS) provide real-time traffic and parking information on campus.



Real-Time Travel
Information

- Adaptive Signal Control Used along METRO Transit's Light Rail corridor. Signal Control is intended to adjust the timing of signals in order to keep traffic flowing efficiently when unexpected changes in traffic conditions occur.
- **Video Monitoring** Traffic cameras are currently utilized on large spans of campus to respond to emergencies and better plan detours necessary during construction projects.
- Real-Time Travel & Parking Space Information Relaying technology used to inform travelers and shorten commute times.
 - Available Parking Messages informs commuters and visitors which University ramps have parking spots available.
 - PTS Website extensive information available online for parking ramps, rates, types of parking (contract, metered, daily, etc.), ordinances, shuttle systems, as well as event, specialty, and Department parking. Includes event calendar to plan out substitute routes and substantial alternative transportation information to reduce single-occupancy vehicles such as carpooling or vanpooling options.

Autonomous Bus Demonstration - Free rides in a self-driving EZ10 Autonomous Bus were given to students, staff, and faculty on April 30th, 2018 to demonstrate how this technology could work in a campus-setting. Going about 6 mph over the Washington Ave Bridge, 450+ people took the 3 minute ride in this fully accessible, 12-passenger vehicle.

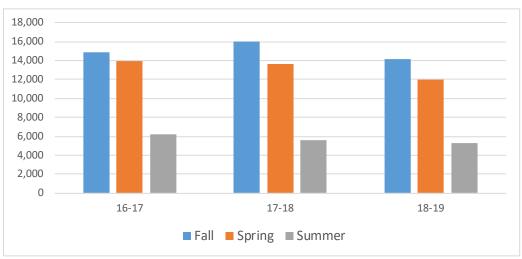


Transit Initiatives

U-Pass Program

The **U-Pass Program** has provided University of Minnesota students unlimited access to every bus and rail route within the Twin Cities. Go-To pass system technology deployed with this program continues to promote quicker boarding times and thus reduced emissions from bus idling.



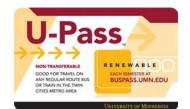


Campus Zone Pass

The **Campus Zone Pass** subsidizes student, staff, and faculty METRO Green Line trips along the three stops within campus boundaries – Stadium Village, East Bank, and West Bank. These light rail passes were first available in 2014 and are free to any registered student or staff/faculty member within the University's PeopleSoft system.

Campus Shuttles

Campus shuttle routes were redesigned in 2016 using the results of an Origin/Destination and Mode Share Survey commissioned by Parking & Transportation Services in 2014 and 2016. These surveys outlined moderate and high areas of demand around campus to locate where bus stops and frequency of service should be increased or could be decreased. New routes have maximized ridership.



Research currently underway on how to integrate transit passes and the U Card into one, using existing Go-To system technology. The planned launch of this design is in 2020 or 2021.

7,997

Campus Zone Passes distributed during the Spring 2019 - Fall 2019 semesters.



4,152,517

Campus Shuttle ridership for the 2019 calendar year.

Transit Initiatives

Campus Shuttles (continued)

Campus Circulator and Connector Routes

Shuttle routes updated in 2016



Transit Fleet - The University operates 27 transit vehicles on campus that provides over 4.5 million trips per year. The University owns 4 hybrid buses and contracts with a private bus company to operate all vehicles.

4 Hybrid Buses (Diesel Fuel)



Serving the Twin Cities campus as of 2019:

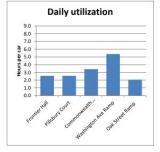
♦ Two 40' Gillig buses

♦ Two 30' Gillig buses

- **Transit Signage** Each University Shuttle stop is marked "Campus Shuttle" and provides riders with stop information and Next Bus Arrivals.
- **GopherTrip** A GPS based app that allows users to locate campus shuttles positions along their routes and see estimated arrival times at specific stops (available for both Android and Apple users).



Gopher RideShare – A new rideshare program that allows students, staff, and faculty to see all available commute options based on their starting and ending locations. Users can find commute partners, save frequently used commutes, calculate personal emission reductions, and more. The application is available for both Android and Apple users.



HOURCAR

HOURCAR is a car-sharing program for University students, staff, and faculty (ages 18+). Numbers below represent data from 2018.

\$40 Membership fee 4 10 Members 1,932 Total Reservations 54,665 Miles Driven

Parking Initiatives

Energy Efficient Lighting

LED (**light emitting diode**) **fixtures** were installed within the 13 parking structures on campus, starting in 2012 with completion in 2016. LED offers a more even distribution of light and better illumination of surfaces and people. Safety-wise, the white light they provide allows for greater user perception in comparison to standard yellow lights. Two types of advanced sensors are used to detect when the lights should turn off - daylight sensing and motion sensing. Surface lot lighting upgrades were completed throughout 2016-2017.

Lighting Efficiency Estimates



\$3.3 million

Cost of retrofit

Estimated lasting time

52% = 58%

Annual energy savings
(compared to previous cost)

which equates to

\$350,000 Annually

University Solar Garden

The Twin Cities campus will purchase 46 million community kilowatt hours of solar garden subscriptions annually over the next 25 years (from Innovative Power Systems, NextEra Energy Resources, and US Solar). Doing so will help achieve the University's mission to reduce greenhouse gas emissions by 50% in 2020 and reach net-zero emissions by 2050 as outlined in the 2011 Climate Action Plan. There will be two garden locations on the Twin Cities campus - Lot C86 on West Bank and Lot 104 on the St. Paul Campus. Both gardens will act as a roof over parked cars where they will produce electricity and renewable energy certificates that will go towards the University's electricity provider, Xcel Energy.

Additional Initiatives

PTS has implemented a 2-hour parking program in several ramps which places parking stalls near an elevator, stair bank, or entrance to a parking facility. The parking is limited to 2 hours between 6 am and 3 pm. This forces cars that typically arrive early and park in one spot all day to leave some stalls that are near the entry and elevators open so that short-term transient cars can quickly access parking and pedestrian paths to destinations, as opposed to driving either up or down in a facility for the arrival and departure causing increased CO2 emissions.

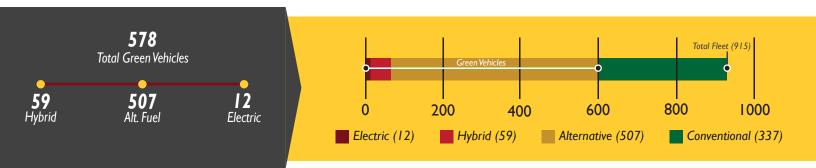


The solar panel installation adjacent to Lot C86

Fleet Initiatives

Green Vehicles

The University's fleet is comprised of approximately 915 vehicles statewide. Fleet Services leases vehicles, helps departments purchase vehicles, and rents out vehicles for University business use. Vehicles within the University's fleet are categorized by one of four fuel types. The Twin Cities campus classifies any vehicle as a **green vehicle** if it does not use conventional fuel. Currently, there are three types of green vehicles used within the University's fleet including Hybrid vehicles, Electric vehicles, or "Alternative Fuel" vehicles that are E85- or B20- feasible. Green vehicles comprise 63% of the Twin Cities fleet, with only 37% using conventional fuel.



Electric Vehicles

University fleet purchased six Chevrolet Bolt all-electric vehicles (shown to the right) as part of a fleet procurement made by the State of Minnesota. These average around 230 mpg per single electric charge. A full-charge takes just over 4 hours (when down to 20% charge).



Hybrid Vehicles

Hybrid vehicles combine the most optimal functions of electric and gasoline engines to increase fuel efficiency and reduce emissions. Regenerative braking - which recharges the electric engines battery through resistance - plays a key role in hybrid vehicle performance.



Alternative Fuel Vehicles

These vehicles run solely on unconventional petroleum. Those used within the University fleet are E85-or B20-feasible. E85 is a 85% ethanol fuel/15% gasoline blend and B20 is a 20% biodiesel/80% petrodiesel blend.



Fleet Initiatives

Right-Sizing the Fleet

The University owns and operates *approximately 915 vehicles* on its system campuses, research facilities, and outreach centers. Each department is responsible for determining its vehicle needs and working with Fleet Services staff to identify vehicle options. Since 2015, Fleet Services has identified vehicles that could be sold or reused by other University departments as well as working on a number of alternatives to owning and operating vehicles on the Twin Cities campus - including sharing of leased or owned vehicles and other ways to move staff around campus for work needs.

Restructuring Vehicle Lease & Rental Rates

The University purchases and leases about **25** different types of vehicles for a variety of uses each year. Fleet Services is studying specific costs of operation, including fuel economy, maintenance schedules, and other factors that influence the cost of ownership over time in order to restructure and realign lease and rental rates for University customers. The key is to find the vehicle with the best value that can also serve the wide variety of needs users have within the University. This work is continuing as vehicle life increases and more data is available for analyzing customer needs and requirements.

Fleet Electrification Efforts

Fleet Services is continually investigating the potential for additional fleet electrification, as an electric fleet saves operating and mechanical costs over the long term while being an environmentally-friendly and sustainable choice. In 2017, Fleet Services purchased six all-electric (6) Chevrolet Bolts in partnership with the State of Minnesota Department of Administration and other agencies. In 2018, Fleet Services continues to research and add other electric hybrid vehicles into the fleet, including the Chevrolet Volt and Chrysler Pacifica. As technology advances with regard to charging capabilities and vehicle range, the University will keep replacing aging vehicles with sustainable vehicle technologies such as electric hybrids and all-electric vehicles.

Department of Energy Alternative Fuel Requirements

Fleet Services continues to exceed the requirements of the Department of Energy (DOE) for a fleet minimum of 75% light duty vehicle purchases of alternative fuel, hybrid, or electric vehicles. The University receives alternative fuel credits for exceeding these requirements on an annual basis.



Received National
Accredited Sustainable
Fleet Award from the
North American Fleet
Association in 2016. Earned
through providing a vigorous
sustainability plan and
concrete reductions in fleet
emissions, fuel consumption,
and increases in fuel
efficiency.



State of Minnesota Department of Administration (Minnesota.gov)



U.S Department of Energy (USGS)

Facilities Initiatives

Biking

Biking continues to be a significant form of transportation used on the Twin Cities campus. In 2016, the Mode Share and Origin/Destination Study reported 10% of all trips made by students, staff, and faculty to and from campus are by bike (out of 19,247 reported trips). Once on campus, 8% of students, staff, and faculty bike to other campus destinations (out of 6,368 reported trips). This calls for high quality campus bike infrastructure not only for the safety of those who already bike, but also for gaining new University riders and retaining bike ridership.

Pleasant St SE



Infrastructure Updates

There are nearly **6.5 miles** of bike lanes on the Twin Cities campus



The Washington Avenue Bridge bike lane has the **highest off-street bike count** in the Twin Cities - with 7,000 bike crossings per day (24 hour timespan)

SE Oak St

Phase I (Complete in 2015):

Two-way delineator protected bike lane installation (from SE Washington Ave - E River Parkway).

Phase 2 (Complete in 2019):

Raised concrete median, improved crosswalk markings & signal systems, and floating transit island at the SE Delaware St intersection.

Underwent restructuring in 2015:

With this upgrade came a widening of the road - allowing for the creation of bike lanes and bike boxes at the intersections of University Ave, Pillsbury Dr SE, and Arlington St.

SE Washington Ave

With the implementation of the METRO Transit Light Rail in 2014 came the *Washington Avenue Transit/Pedestrian Mall*. From Walnut St SE to Church St SE, general traffic is not permitted. Bicyclists and emergency vehicles share the outside lane, while the buses and light rail share the METRO rail tracks.

Campus Biking Quick Facts

20Nice Ride Stations on campus.

0433

Total secure bike parking and bike locker spaces after additional secure bike parking was implemented within the Washington Ave and 21st Ave ramps.

9,000+

Number of bike racks on campus.



West Bank Nice Ride Station

Facilities Initiatives

Biking (continued)



Zap Program - A biking incentive program for University students, staff, and faculty. Uses Dero's solar-powered technology to track commutes and reward users.

- Gift cards from local businesses distributed to U of M students who commute by bike at least 12 times per month (summer months) or 8 times per month (winter months).
- Wellbeing added higher insurance reduction. Users can now earn 250 wellbeing points through earning I25 Zaps (previously could only earn 100 wellbeing points with 50 Zaps.)
- Partnered with Nice Ride to allow faculty and staff to link their memberships with their Zap accounts. I 0 minute Nice Ride trips act as a standard Zap and can be counted towards Wellbeing points.
- The millionth Zap on the Twin Cities campus was reached on November 4, 2019.

U of M Zap Program Statistics (Jan 1, 2012 - Jan 1, 2020)



998,319 Zaps



7,739,354 Miles Biked



5,362,266 lbs CO, reduced



239,919,964 Calories Burned



276,406Gallons Saved

Total Number of Electric Vehicle Charging Stations (2018):

Level 2 - 36 Plugs
Level 3 - 1 Plug

Total: 37 Plugs

Electric Vehicle Charging Stations

Information about EV on TC Campus - There are 13 Electric Vehicle charging locations around the Twin Cities Campus. Users of these charging stations only need to pay the parking fee for the facility - the electricity itself is free for users. In 2019, Parking & Transportation spent \$15,500 on electricity for charging EVs (assuming 11¢ per kWh).

East Bank Locations:

♦ 4th Street Ramp/Oak Street Ramp/East River Road Garage four level 2

♦ University Avenue Ramp/Washington Avenue Ramp/Church Street Ramp/Lot 37/Maroon Lot - two level 2

♦ Graduate Hotel - one level 3

West Bank Locations:

♦ 19th Avenue Ramp/21st Avenue Ramp/Lot 86/West Bank Office Building Ramp two level 2

St. Paul Locations:

♦ Gortner Avenue Ramp four level 2 Level 3 charger at Graduate Hotel



Facilities Initiatives



Electric Vehicle Charging Stations (continued)

U of M Electric Vehicle (EV) Charging Infrastructure Statewide - A comprehensive and connected system of EV charging stations throughout Minnesota is essential to increasing the number of EVs within University/College fleets and among local residents. Discussions on where to locate new EV Charging infrastructure around the state have been underway. Doing so will not only make EV ownership more feasible but also help to reduce campus carbon dioxide emissions.

System Campuses EV Charging Numbers (2018)

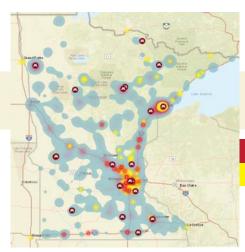
Fleet - 2 (Level 2)

U-Market - I

Morris Campus - I (Level 3)

WROC - I

UM-Duluth - I



UMN Fleet Fuel Usage Across System Campuses (May 2016-May 2018)

Red = high fuel usage in area

Yellow = moderate fuel usage in area

Electric Scooters

With the rise of electric rental scooter use in the Twin Cities, the 2018-2019 academic year has seen a tremendous number of scooter rentals as well as miles traveled by scooter on campus. They are very popular due to their versatility, affordability, and potential to help students with their first and last mile of their commutes. Electric scooters can also reduce the number of vehicles on campus. The following data comes from the 2019 release season of Lime, Spin, and Lyft companies. The release season varies depending on the company, but typically occurs between July and November.

Electric Scooter Ride Data

O 162,216

Scooter rides that started and ended on campus

92,758

Scooter rides that started on campus and ended off campus

 \bigcirc 68,171

Scooter rides that started off campus and end on campus



Internal Operations Initiatives

Office Operations



Ongoing sustainability initiatives occurring daily within the Parking & Transportation Services office:

Reduce, Reuse, Recycle: PTS is constantly working to reduce the amount of waste generated within our office. Some small ways this is achieved is through shared office supplies, encouraging employees to use their own utensils and dishes, and printing documents only when necessary. Sharing office supplies both reduces office waste and department money spent, as these items are not constantly needing to be restocked. When items have reached the end of their functional life, separate trash, paper, and plastic/glass recycling bins are available to employees and visitors.

- Internal waste management: PTS is on the list to receive organics recycling for their Washington Ave office location. This will not only allow food scrapes to become rich compost, but will also decrease the amount of compostable cups and utensils ending up within the standard trash and recycling stream.
- O Finance: The finance department has switched over to administering only electric invoices. This has substantially reduced the amount of paper used within the office.

Alternative Transportation: An ongoing part of maintaining campus bicycle facilities is the

tagging and removal of abandoned bikes. Tagging is done on a request basis during the fall-spring semesters and on a larger scale during the summer semester. If the bike has not been claimed within one week of being tagged, it is considered abandoned. PTS Maintanence removes the bike from the rack and it is then sent to the University of Minnesota ReUse Center to be repaired or resold. Hundreds of bikes are sent to the ReUse Center each year and are resold or recycled.

A tagged abandoned bike on the Twin Cities campus and the University of Minnesota ReUse Center logo.



Executive Summary

The University of Minnesota Twin Cities campus - Minnesota's largest academic institution - has a duty to take a leadership role in encouraging environmental responsibility on a statewide level. The University is committed to advancing the public good and improving the human condition, and Parking and Transportation Services (PTS) continues to exemplify the University's commitment through its own sustainability initiatives. As PTS oversees a wide range of services, it has the unique opportunity to impact many different scopes of campus environmental issues and solutions.

PTS is responsible for the following campus services: intelligent transportation system designs, transit, parking, fleet, transportation facilities, and internal office operations. Not only is environmental responsibility a vital component of each of these services, it is additionally at the forefront of any decision when changes are being considered. This dedication can be seen through receiving these (and other) various distinguished awards and recognitions: *National Accredited Sustainable Fleet Award*, *Bicycle Friendly University Platinum Award*, *Bicycle Friendly Business Platinum Award*, and *Lighting Energy Efficiency in Parking Campaign (LEEP) Award* for numerous campus ramp renovations.

Furthermore, the statistics and initiatives highlighted within this document demonstrate how PTS advances campus sustainability on every level - from switching to electronic invoices, to using real-time travel and parking space information relaying, redesigning campus shuttle routes to maximize ridership, partnering with a rideshare company to provide students, staff, and faculty with more commute options, continuously increasing the number of green vehicles within fleet, incentivizing biking and walking with the Zap Program, expanding electric vehicle charging infrastructure across the state, and more.

With real-time travel information and adaptive signal control, campus visitors are able to reduce their commute time. Emissions from engine idling have also significantly been reduced with the deployment of this technology. For those who opt to use METRO transit for commuting, the U-Pass and Campus Zone Pass provide greatly discounted rates to students, staff, and faculty for traveling around the Twin Cities. Campus shuttles, which underwent route redesigning in 2016 to better suit rider needs, help reduce traffic congestion by offering a reliable and safe transportation alternative for getting around campus.

Executive Summary

With the help of Fleet Services, departments are able to lease, rent, and purchase green vehicles. There are 928 total vehicles within fleet - 591 of which are green vehicles. Green vehicles include hybrid, alternative fuel, and electric vehicles. Within the last years, Fleet has undergone numerous efforts in order to right-size the fleet, restructure vehicle leases and rental rates, as well as electrify the fleet. Such efforts have made it possible to not only meet but exceed requirements set by the Department of Energy for having 75% light-duty vehicles within the University's fleet.

Currently, the Twin Cities campus has 13 electric vehicle charging stations. The majority of these stations are Level 2 chargers. In the future, PTS will strategically install electric vehicle infrastructure to make owning an electric vehicle a more viable option for commuters. Other University of Minnesota campuses have been involved in the conversations concerning locations forfuture electric vehicle charging stations. A statewide, connected system of chargers is vital to increasing the number of electric vehicles within the University fleet and the rest of Minnesota.

The number of bikers on campus continues to grow as infrastructure and incentives increase. There are a total of 6.5 miles of bike lanes on campus, 433 secure bike cages or lockers, and 9,000+ bike racks. Planned construction projects will only help to increase the mileage of bike lanes on campus. The Zap Program, managed by Parking and Transportation Services, promotes use of campus biking facilities by incentivizing students, staff, and faculty who commute by bike or on foot. Offering incentives for those using alternative transportation methods helps advance the university's goal of reaching carbon neutrality, as discussed in the 2011 Twin Cities Climate Action Plan.

As new ideas and innovations arise within the environmental sector, Parking and Transportation Services at the University of Minnesota Twin Cities will continue to advance its already aggressive approach to campus sustainability. This will be done by continuing to expand and create enjoyable and safe alternative transportation infrastructure, encouraging the use of multiple modes of transportation, and by making informed decisions to meet current needs without jeopardizing the needs of future generations.

Appendix I

2011

•Minnesota Association of Government Communicators' Northern Lights Award - for feature story "It Ain't Just About Parking Anymore" •Bicycle Friendly Business Silver Award - sustained designation

2012

•Commuter Choice Award - U of M Bike Center and RFID Program

•International Parking Institute Award of
Excellence - for U of M Bike Center & RFID
Program: Validating Bike Commuters
•Minnesota Association of Government Communicators' Northern Lights Award - for "Where's My
Bus?" campaign and press release writing

2013

•Bicycle Friendly Business Gold Award - from League of American Bicyclist

2014

•Lighting Energy Efficiency in Parking Campaign (LEEP) Award - for the Northrop Auditorium Garage in the category of "Highest Percentage of Savings in a (lighting) Retrofit at a Single Parking Structure" •'Best Paper'Award - from the TRB Annual Meeting from Highway Capacity and Quality of Service Committee for the paper "Methodology for Developing an HCM-based Oversaturated Speed Flow Model"

•Bicycle Friendly Business Gold Award - sustained designation

2015

•Lighting Energy Efficiency in Parking Campaign (LEEP) Award - for the Gortner Avenue Ramp in the category of "Greatest Percent of Savings in a Single Structure (retrofit)"

- •Lighting Energy Efficiency in Parking Campaign (LEEP) Award for the Gortner Avenue Ramp in the category of "the Best Use of Lighting Controls in a Single Parking Facility"
- •Bicycle Friendly University Platinum Award from League of American Bicyclists

2016

•Accredited Sustainable Fleet Award - from the National Association of Fleet Administrators (NAFA)

•Lighting Energy Efficiency in Parking Campaign (LEEP) Award - for 19th Avenue Ramp in the Category of "Highest Percentage Energy Savings in a Retrofit at a Single Parking Structure"

•Lighting Energy Efficiency in Parking Campaign (LEEP) Award - for East River Road Garage in the category of "Highest Absolute Energy Savings in a Retrofit at a Single Parking Structure"

2017

•Bicycle Friendly Business Platinum Award - from League of American Bicyclists (one of two Universities nationwide to receive both a Platinum University and Business designation)

Minnesota Association of Government
 Communicators' Northern Lights Award - for illustration/outline of the campus shuttle system
 Minnesota Association of Government

Communicators' Northern Lights Award - for pocket-sized Transportation Guide & Campus Map •Minnesota Public Transit Association's 2017 MN Bus Operator of the Year Award - George Retezan from First Student (winner)

•University of Minnesota Communicators Forum Maroon Award - for design of the pocket-sized Transportation Guide & Campus Map

Appendix I

2018

- •Minnesota Association of Government Communicators' Northern Lights Award - for
- "Where Routes Go" video
- •Minnesota Association of Government Communicators' Northern Lights Award - for campus shuttles "How to Ride"
- •Minnesota Association of Government Communicators' Northern Lights Award - for PTS Wellness Bingo
- Bicycle Friendly University Platinum Award from League of American Bicyclists
- Bicycle Friendly Business Platinum Award from League of American Bicyclists

2019

- Bicycle Friendly University Platinum Award from League of American Bicyclists
- Bicycle Friendly Business Platinum Award from League of American Bicyclists

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