



This edition of RMCREF Spotlight features Carbin, an app that measures road quality and vehicle properties while directing you toward your destination. Carbin has already surveyed more than 35 thousand lane miles around the world and builds upon research conducted at the MIT Concrete Sustainability Hub (CSHub). *The MIT CSHub is co-funded and by the RMC Research & Education Foundation and Portland Cement Association.*

The data collected using the Carbin app can be used to demonstrate the need for increased infrastructure investment to policy makers. It can also provide important information to state Departments of Transportation (DOTs) and municipalities about the condition of their roadways, so that they understand which roadways are performing best and can appropriately direct their infrastructure dollars. Until now, it has been very costly and time-consuming for state DOT's to collect data to identify roads in need of repair or reconstruction. Now, transportation-related businesses like ready mixed concrete companies, and even the general public, can help collect this valuable data to help promote better, safer roadways. Poor road quality not only impacts the driving public, but also the environment. For example, on California's highways, rough pavement caused cars to consume 1 billion gallons of excess fuel over just a 5-year period. Carbin calculates this impact on the environment as well, providing a more comprehensive snapshot to decision-makers.

How it works: Carbin uses an instrument that most of us carry in our pockets—our smartphones. Smartphones use accelerometers to orient the phone's screen and accomplish other tasks. Phone accelerometers are so sensitive that they can detect the slightest bumps in a pavement from within a moving vehicle. Carbin utilizes a phone's accelerometer by recording the motion of a vehicle roughly 6,000 times every minute and then uses an algorithm to determine a road's roughness.

What you can do: Each Carbin user adds to a growing map of pavement quality around the world with every trip they take. Imagine how much data can be collected by ready mixed concrete truck fleets, as well as individual users. **Encourage your team to download and use the Carbin app. The app is free and can be downloaded in the iOS or Android App Store.** It is simple to use – just turn on the app and either place the device on the floor or in a holder. The app will work in the background on a cell phone or tablet, collecting road roughness data even when the screen goes dormant. The roughness data is then used to update and populate the FIX-MY-ROAD map as pictured. To find out more about the program, visit the website at <http://fixmyroad.us>.

What's in it for you and your company: In addition to providing important information on infrastructure needs and environmental impact to policy makers, and helping direct you to your preferred route, Carbin can also analyze the unique "signature" of your truck or car. It detects vibrations through a vehicles's frame, so if that "signature" changes over time, Carbin can determine if the change is due to a misaligned wheel, an under-inflated tire, or a more serious problem with the vehicle. The app may serve as a personal mechanic, with its finger on your vehicle's pulse.

Collected and analyzed with
carbin

FIX-MY-ROAD

and pave a better future for OUR CLIMATE

Road quality affects (1) Safety, (2) Traffic, (3) Comfort of Driving, (4) Fuel Consumption and (5) Quality of Air. Road roughness as a universal indicator of road quality. Therefore, using 25% quantiles of the roughness distribution, values are categorized from best to worst: **good (0-25%)**, **average (25-50%)**, **fair (50-75%)**, **poor (75-100%)**. Values are divided into two distributions: highways and local roads.

Our Story Take Action **Results** News Contact

Good Average Fair Poor

Bottom line: What the Carbin app offers users is a unique set of tools to better understand vehicles and the infrastructure around them. For cities and states, it may become a vital way to improve pavements and reduce emissions. Above all else, Carbin can foster a culture of sustainability to which we call can contribute.

Testimonial by William Larson, CalPortland - To further assist in the collection of roughness data within the CalPortland market area of WA, OR, CA, NV and AZ, we recently sent a request to all our employees explaining the Carbin app. It has been embraced by our team and the resulting collection of data is rapidly beginning to grow. This will give us important information to provide to policy makers in the states in which we operate to advocate for increased highway funding and more concrete roadways.

For more information on the work of the RMC Research & Education Foundation, please visit www.rmc-foundation.org or contact [Julie Garbini](#) or [Jennifer LeFevre](#).

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