

# STREETSTRIDER®

## Even Better Than the Real Thing?

### Exclusive ACE study examines fitness benefits of new elliptical cross-trainer on wheels

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The first elliptical cross-training machines began popping up in the 1990s and quickly ranked among the most popular equipment in gyms and fitness centers across the nation. In fact, according to the Sporting Goods Manufacturers Association, the use of elliptical trainers grew by 220 percent from 2000 to 2007. People gravitated toward the elliptical machines because they provided a vigorous workout that was less stressful on the joints than other machines, thanks to its smooth, low-impact elliptical motion.

But while there is no denying the fitness benefits of elliptical machines, not everyone enjoys spending time exercising indoors. “These [ellipticals] were the most popular pieces of equipment in the gym, and they gave the best overall exercise, very much like cross-country skiing,” says Dr. David Kraus, inventor of the StreetStrider “But I didn’t want to be stuck in the gym.”

For 20 years, Kraus, a former associate professor of biology at the University of Alabama, Birmingham, enjoyed commuting to work by bicycle, 20 miles each way. It was during those long rides that he came up with the idea of combining the benefits of biking and elliptical exercise into one device—and, in 2005, the StreetStrider was born.

Basically an elliptical cross-trainer on three wheels designed to be ridden outdoors, the StreetStrider uses the movements of both the legs and the arms to meld the motion of jogging, cycling and cross-country skiing into one. The elliptical motion of the feet drives the chain, while the arms push on the Strider poles, adding extra torque to the rear wheel. Steering is accomplished by leaning the body into the direction you want to go.

In 2009, Kraus’ StreetStrider received big exposure when it was used on NBC’s reality TV weight-loss show *The Biggest Loser*. Physician and TV host Dr. Oz has also hyped it. Today, StreetStrider offers five models ranging from a \$900 single-speed version to an \$1,800 eight-speed model; also available is a \$500 StreetStrider aimed at kids ages five and up. Their advertisements hail “StreetStriding is the exercise of the future” and claim calorie burns of up to 1,000 calories per hour.

With all this publicity and excitement surrounding StreetStriding, the American Council on Exercise, the nation’s Workout Watchdog, decided to take a closer look at the new elliptical machine and gauge its true exercise effectiveness.





## The Study

To test how the StreetStrider compares to an indoor, stationary elliptical cross-trainer, ACE enlisted a team of exercise scientists from the University of Wisconsin, La Crosse, Exercise and Health Program. Led by John Porcari, Ph.D., and Jordan Becker, M.S., the team recruited 15 healthy adults (seven males and eight females) from the local La Crosse community. The test subjects spanned a wide age range, from 19 to 53, but all had previous experience exercising on stationary elliptical exercise machines.

For one week prior to the study, each of the subjects was allowed three 15- to 20-minute practice sessions to get used to riding the StreetStrider. Next, to establish a fitness baseline, all subjects performed a maximal exercise test using a Precor® EFX 576i elliptical cross-trainer, much like those found in commercial gyms and fitness centers. During that test, researchers continuously measured the subjects' heart rate (HR) and oxygen consumption (VO<sub>2</sub>), and then followed up by surveying each subject for his or her rating of perceived exertion (RPE).

Next, the subjects participated in two more 30-minute exercise tests (performed in random order). One test required each participant to ride the eight-speed StreetStrider Summit 8r at his or her

own pace around a 200-meter indoor track at the University of Wisconsin. Although the StreetStrider is designed as an outdoor fitness device, inclement winter weather required researchers to conduct the test indoors. The second test consisted of a 30-minute workout on the Precor stationary elliptical cross-trainer, again with each subject exercising at his or her own pace. Throughout, researchers kept tabs on each subject's HR, VO<sub>2</sub> and caloric expenditure, and followed up with a Physical Activity Enjoyment Scale (PACES) questionnaire to determine how much they enjoyed each exercise.

## The Results

After all of the tests were completed and the numbers were crunched, Porcari and his team reported that the StreetStrider burned more calories and elicited a significantly greater HR, % of heart-rate maximum (HRmax), VO<sub>2</sub>, and percentage of VO<sub>2</sub>max than the conventional stationary elliptical exercise machine.

In particular, this study found that exercise using the StreetStrider burned an average of 423 calories for 30 minutes (that's 14.1 kcals per minute) in men, while women burned an average of 276 calories (9.2 kcal/min). Average that all out and you're looking at the StreetStrider burning approximately 12.7 percent more calories per minute than traditional elliptical machines (Table 1).

The data also showed that riding the StreetStrider elicited an average of 85% HRmax and 71% VO<sub>2</sub>max during the 30-minute exercise test. That works out to a rough average of 13 percent higher values from the StreetStrider than the elliptical machine.

"Basically, with the StreetStrider you burn more calories and get your heart rate up higher than with the typical elliptical machine," explains Jordan Becker, M.S.

When it comes to RPE, the female subjects rated their exertion on the StreetStrider significantly higher than on the conventional elliptical machine; the male subjects, however, rated both activities similarly.

Finally, analysis of the post-activity enjoyment questionnaire indicated that the StreetStrider was enjoyed slightly more than the

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elliptical cross-trainer, but the difference was not statistically significant.

### The Bottom Line

“The StreetStrider is a tremendous workout,” says Porcari.

Why the large boost in calorie burns, heart rate and VO2 while working out on the StreetStrider versus a conventional elliptical? Experts think it’s because of the active role the arms and upper body play in propelling the StreetStrider.

“On the regular elliptical you can offload some of your body weight onto the handrail supports,” explains ACE’s Chief Science Officer Cedric Bryant, Ph.D. “But with the StreetStrider you have to really actively engage your upper body, as well as maintain your body balance while you’re doing it.”

Though the results favored the StreetStrider, Porcari suggests that his researchers might have seen even better results from the new machine had they been able to test it outdoors. “Because of the weather, we had to do the study indoors on a 200-meter track,” he explains. “My gut feeling is that we would have seen bigger differences physiologically and psychologically. Subjects could have gone faster and there would’ve been variation in terrain. They could just go—and it would feel more like play.”

Play. That’s the key word here. Naturally, exercise enjoyment is critical to exercise adherence. So the more you enjoy a workout, the more you’ll do it, and the better body benefits you’ll see. While the results of the post-activity questionnaire in this study showed that the subjects didn’t enjoy the StreetStrider significantly more than the Precor elliptical trainer, the fact that the subjects were confined to riding it on an indoor track may have unfairly limited their enjoyment of the machine.

“I had the opportunity to ride the StreetStrider outside, and I loved it outside,” says Becker. “This is such a good workout and I wasn’t bored. I was working harder, but felt like I could go longer. Personally, I enjoyed it more than working out in a gym.”

Fun or not, Bryant says he was a bit concerned that some individuals might have difficulty getting used to the motion required to ride the StreetStrider. However, researchers reported that people picked it up very quickly. It only took a session or two and they improved with each session.

Porcari did note some concerns that the StreetStrider could feel cramped to some larger exercisers. “Ergonomically it seems a little small,” he says. “The handles almost come in too close to your body, like it’s built for a smaller person. But that’s one of the only criticisms.”

Bottom line: The StreetStrider is one heck of a workout and a great alternative to traditional indoor cardio exercise machines. Does that mean the notoriously tough Workout Watchdog is giving the StreetStrider its endorsement?

“The results are the results,” Bryant says with a smile. “This is one exercise product that actually lives up to its billing.”

Table 1. Responses to self-selected exercise using the StreetStrider and elliptical trainer			
Variable	StreetStrider	Elliptical	Difference (%)
<b>HR (bpm)</b>			
Males	142 ± 21.3	130 ± 14.7	13* (9.2)
Females	165 ± 16.3	149 ± 22.2	16* (10.7)
Overall	155 ± 21.6	140 ± 20.9	15* (11.1)
<b>%HRmax</b>			
Males	81 ± 11.5	74 ± 10.1	7* (9.5)
Females	89 ± 7.3	80 ± 10.9	9* (11.3)
Overall	85 ± 9.8	77 ± 10.5	8* (10.4)
<b>VO<sub>2</sub> (mL/kg/min)</b>			
Males	31.6 ± 3.33	27.7 ± 4.81	3.9* (14.1)
Females	29.5 ± 3.80	26.4 ± 6.75	3.1* (11.7)
Overall	30.5 ± 3.65	27.0 ± 5.76	3.5* (13.0)
<b>%VO<sub>2</sub> max</b>			
Males	69 ± 10.4	60 ± 15.9	9* (15.0)
Females	73 ± 9.8	65 ± 15.4	8* (12.3)
Overall	71 ± 10.1	63 ± 15.2	8* (12.7)
<b>Kcal/min</b>			
Males	14.1 ± 2.79	12.4 ± 3.63	1.7* (13.7)
Females	9.2 ± 1.11	8.2 ± 2.0	1.0* (12.2)
Overall	11.5 ± 3.23	10.2 ± 3.50	1.3* (12.7)
<b>RPE</b>			
Males	13.1 ± 2.01	12.6 ± 1.18	0.5 (4.0)
Females	14.1 ± 2.01	12.6 ± 1.78	1.5* (11.9)
Overall	13.6 ± 2.00	12.6 ± 1.48	1.0* (7.9)

\* Indicates a significant difference between StreetStrider and elliptical cross-trainer (p<.05).

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