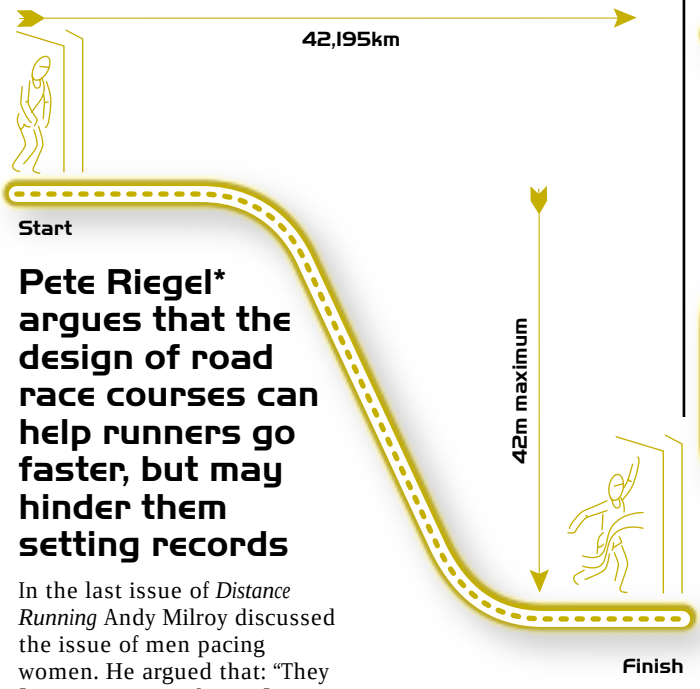
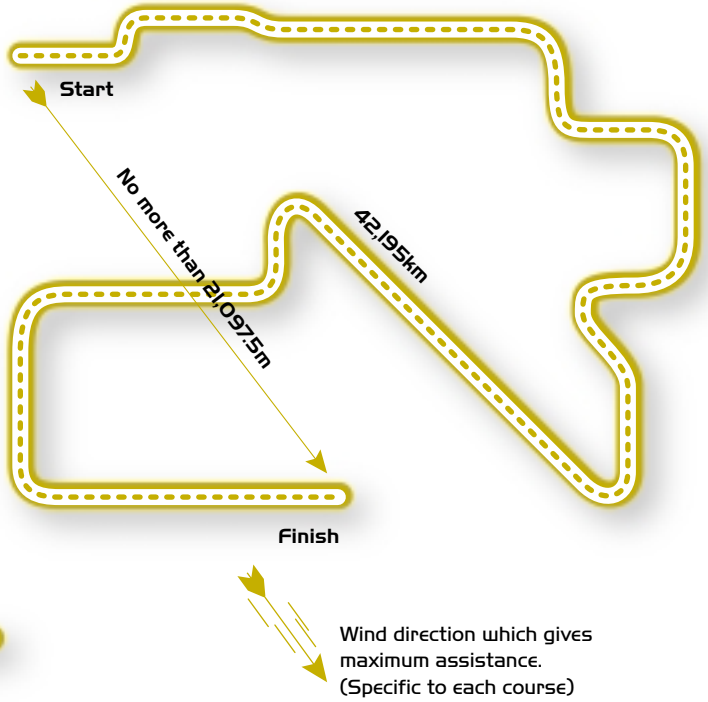
Records by design

'Drop' criteria for world records



'Separation' criteria for world records



Pete Riegel* argues that the design of road race courses can help runners go faster, but may hinder them setting records

In the last issue of *Distance Running* Andy Milroy discussed the issue of men pacing women. He argued that: "They [women, in mixed races] are setting aid-enhanced performances.."

A record is a great success for a race. Most organizers will do whatever they can to give the runners the best conditions possible for setting records. This is understandable and, within limits, praiseworthy. But "aid" can get out of hand, and then bad things happen.

Pacemaking is quite a subtle form of aid, and within the rules. Its effect is difficult to quantify and it has long been an accepted practice. Controversy only arose when women began running in the same races as men. Men can more easily aid women, by pacing them all the way to the finish, than can other women. But other kinds of aid can more obviously improve a runner's performance – like a downhill course.

If every venue had equal conditions then the chance of records being set would be greatest. If one particular venue has qualities that favor speed, then potential record-setters will beeline to that venue. Those who don't will be at a disadvantage. This makes the organizers of that particular race very happy – they get their record, and it's going to be tough for anybody to best it at any other venue. Over time this reduces the number of records set. It reduces the opportunities for athletes and puts all other race organizations at a disadvantage. Overall, it reduces the publicity that the sport receives - as each occasion when a record is broken is a newsworthy event.

Anyone can run faster going downhill than they can on the flat, or uphill. Similarly, having the wind at your back is an advantage. In head-to-head competition these factors don't matter; only the win counts. But when records are set, course design is crucial.

There is one marathon course in the US that drops almost 1500 metres between start and finish. The races held here are small, with no prize money. Should significant prize money become available, it is certain that faster runners would come. Given the nature of the course the times would be very fast. If this course was eligible for records, the sport could degenerate into a one-race-per-year record hunt.

Decades ago a race in the USA was held on an open causeway over a body of water, dead straight for about 38km. One year there was a strong tailwind, and top runners enjoyed personal bests by 5 to 10 minutes. Although the fast times bettered existing records, they were not recognized in the US.

With official IAAF-recognized world records on the road, course design has become an important factor. Standards have been set limiting the amount of 'drop' (decline in elevation from start to finish) and 'separation' (straight-line distance between start and finish, expressed as a percentage of the race distance). If a performance is to be eligible for consideration as a record, then the course on which it is set must conform to these limits.

Allowable drop has been established at 1 metre for each kilometre of course length, which is the same as that allowed for in the construction of a running track. The limit on separation is intended to reduce the aid afforded by tailwinds. The US established a limit of 30% 'separation' in the early 1980s, and this came to be internationally recognized as a satisfactory figure. IAAF has recently revised allowable 'separation' to 50%.

There is constant pressure, from the organizers of races with aided courses, for relaxation of standards. They argue that if standards are relaxed a little, more records will result. While this is true in the short term, it is not true over time.

Consider the extreme example of a track with its 100m straight built slightly downhill, while all the others are essentially level. Over time, the 100m records would favor that venue. At all other athletics venues competitors would be at a disadvantage, and the record opportunities would be few.

In the real world the aid given by various road configurations is slight (despite the examples given above). Races come in all shapes and sizes.

Statistics can rarely prove the advantage of one course over another, and choosing proper limits for drop and separation is no simple task. The sport of road running existed before records existed.

When we began to deal with the US situation, the effect on existing races was a major consideration. No-one wanted to shut out a large proportion of races. If the drop and separation had been set at zero nearly 50% of US courses would have been excluded from consideration for record-setting purposes. This seemed extreme.

We looked at different combinations of drop and separation and found that the 1m/km drop and 30% separation criteria included 90% of US courses. If we relaxed the standard we only got a very small increase in the number of courses eligible. We thought that these limits gave negligible aid and yet included almost all races.

Because US records include age-group performances, many are set each year. This allows us to make statistical comparisons. As yet we have not detected any bias.

The system appears to be working and is generally considered fair. Standards of course design ('drop' and 'separation') should be defined tightly enough to yield comparability between courses, while excluding as few of them as possible.

* Pete Riegel was Chairman of the Road Running Technical Council of USA Track & Field from 1986-2000 and IAAF/AIMS International Measurement Administrator for the Americas from 1993-2002