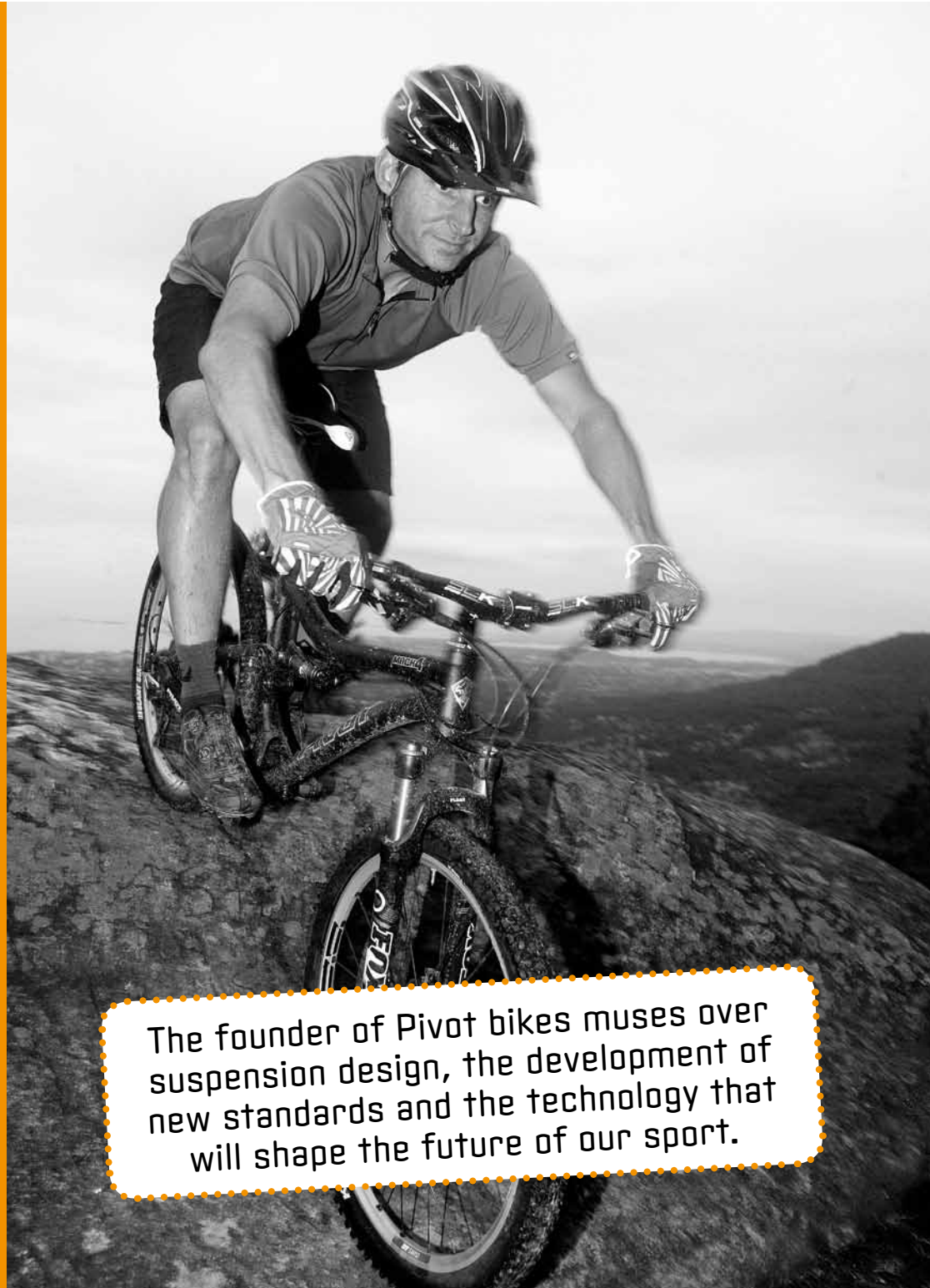


CHRIS COCCALIS — a Pivotal Personality



The founder of Pivot bikes muses over suspension design, the development of new standards and the technology that will shape the future of our sport.

Okay, we'll excuse you if you've never heard of Chris Cocalis. He may not present a loud and eccentric persona like Gary Fisher, or have his name emblazoned across an entire range of components like Tom Ritchey or Keith Bontrager, but within the industry this quietly spoken American is recognised as one of the most progressive and influential bike designers of the present day.

Chris is the man behind the extra-wide press-fit 92 bottom bracket standard that now features on many new bikes. He pushed hard to see that direct frame mounted front derailleurs came to fruition, and they are now used to solve mounting problems on many creative new frame designs. He also played a key design role in Shimano's 2005 XTR groupset.

Currently the CEO of Pivot Cycles, he started out as the 'bike shop rat' when he was nine years old, taking out the garbage and changing inner tubes in exchange for stickers. At 12 he got into BMX racing and was always the guy who worked on everyone's bikes around the neighbourhood.

He designed his first frame at 16, as he'd outgrown the 'pro XL' length bikes of the time and had the creation welded up for him. Mountain biking took his interest once he moved to Arizona and he studied engineering for three years at college. In 1988 he brazed together his first steel MTB frame in cohorts with the guy who started NORBA (North American Off Road Bicycle Association). Going under the Sun Eagle brand name, their elevated chain stay 'Talon' hardtail appeared in *Mountain Bike Action* in a

'Bike's of the Future' feature alongside the Mantis and Nishiki Alien (a few names that will bring back the memories for the old school types).

In 1990 at just 20 years of age he started Titus; a well respected name that held its own amongst other desirable US based boutique brands for the following 17 years. Titus eventually merged with a composites company but Chris didn't like the direction that the new partners wanted to take the company.

In 2006 he had the option to be bought out. Chris says, "I made the best of a really bad situation and chose to leave the company that I started and ran for so many years, but in the end it was no longer what I stood for, so I left the company with a one year no-compete." Titus eventually went bust.

Far from done in the bike game, Chris

started Pivot Cycles in 2007. It was his opportunity to take everything he'd learnt with Titus and designing bikes for other companies (Univega, Diamond Back, Dean, Slingshot etc.) and put it into practice.

He now has 19 employees, and within the first three years Pivot had surpassed where Titus had gotten to after 17 years—quite an achievement given the less than ideal market in recent times.

Cocalis may be the CEO of a well-respected bike brand and an astute businessman, but more than anything he comes across as the consummate bike nerd and tinkerer. He really is the 'ideas man' behind Pivot—he rides hard, tests his own products and refines them based on his own perceptions. He's also not shy of a chat, as we discovered when he popped by to check out our local trails...

►► **What's a normal day in the life of Chris Cocalis?**

It depends. When I'm at home in Arizona I've got my wife and two boys who are eight and 10 years old. We live on the back of a trail system and I try to ride to school with the boys each day. Then a lot of the time my wife and I will go for a ride before we head home, shower and get to work. At that point I turn into a bit of a workaholic and I often won't get back home until somewhere between 8:00pm and midnight.

I also travel about five months of the year, spending a lot of time in Asia and Europe. So it's busy but it's cool. I'm involved with a lot of different things and stay pretty plugged in with the component manufacturers. Aside from running the company, when I'm at work the product design is really my passion. My office is right next to the engineering office and a good part of my day is spent working on projects and working with our engineers.

►► **The Pivot range isn't all-encompassing—there are no XC hardtails or cyclo-cross bikes and only one 29er. What motivates you to create a particular model?**

The first Pivot bike that we designed was the Mach 4, and then the Mach 5 came almost in conjunction with that. During the Titus days we had a lot of great bikes but the 100mm travel Racer X was really my baby. It was the bike that I was known for and it was our best seller, yet there were certain things that I wanted to improve upon. The Mach 4 gave us the opportunity to do those things.

Our trail bikes grew from the Mach 4 and it's a segment that's really important to us. We are based in Phoenix Arizona, right next to South Mountain. The terrain is very much like Moab and the lower portion of the Porcupine Rim; it's very rocky and sandstone based with lots of ledges and drops. Bikes like the Mach 5.7 and the Firebird work really well in that terrain—they are probably the two bikes that I ride the most.

Before I left Titus we had the Racer X 29 and that was back when the whole 29er thing was in its infancy. With Pivot, the lateral stiffness and anti-squat of the DW-Link suspension really transfers well to the 29-inch format, so our Mach 429 was a natural progression from the Mach 4.

From day one we had people asking us

when we were going to do a downhill bike. This came about because Dave Weagle, the man behind the DW-Link suspension system, comes from a downhill background. He'd had great success with the Iron Horse Sunday, which was ridden to something like seven or eight world championships. When Iron Horse fell apart people came looking to us. Right from the get-go I wasn't going to make a downhill bike; it just wasn't at the top of my to-do list, but three and a half years in we decided to do something—that was one where we really leaned on Dave, as he has so much experience in the downhill arena.

►► **All of your bikes share the same short-link four-bar suspension system. Why did you choose this over a Horst Link or single pivot?**

In my year off after getting out of Titus, I spent a lot of time riding pretty much anything that I could get my hands on. One of the things I'd learnt from this, as well as my work with four-bar horst link and single pivot bikes in the past, is there are always compromises that you have to dance around. With four-bar links it's easy to get fully active braking and easy to produce nice active travel, but as you increase the amount of travel, it becomes really hard to control the bob and the squat under power. You're then left reliant on heavier platform damping or inertia valved shocks to compensate and in the process you are giving up traction and other things to get good pedalling performance.

With a single pivot or a four bar you can position the horst-link and main pivot in a variety of locations to achieve the axle path you desire, but it's going to set the wheel into a relatively constant arc. The chainstay length will grow (or not grow) at a constant rate, so you are left designing it to perform well through a portion of its travel, with compromises elsewhere.

There are some big benefits to having a rearward axle path in the first part of the travel (anti-squat for efficient pedalling and square edge bump absorption), but this causes chain growth (chainstay lengthening) and too much of that is a bad thing—you have to pick your poison and deal with the compromises.

A dual link design lets you control and vary the wheel travel path in a way that you simply can't achieve with the other systems. It allows you to get that balance by having a rearward axle path in the initial travel without the negative aspects excessive chain growth. The design also helps us improve stiffness with the one piece rear end and short links.

►► **Why did you go to Dave Weagle and licence his short-link four-bar as opposed to designing your own or using one of the other similar systems?**

Well I was working on my own and I had a couple of different suspension designs that looked like crossing over into the instant centres of the DW-Link patent. I've known Dave for a long time so I called him up and told him what I was working on and asked if he was interested in working together on it. At the time he was working with Ibis and Turner, and I'm good friends with Dave Turner. We all thought it would be cool to have our brands pushing this technology together—things just fell into

place from there.

I never designed my bikes from an anti-squat perspective. For me it was always leverage rate curves, wheel travel paths and braking effect on the suspension. With Dave (Weagle), a lot of his focus is on the riders' centre of mass, their power input to the pedals and his whole anti-squat equation.

The Mach 4 was pretty cool as it really brought our two design perspectives together. I'd given him all the data we'd been working on and he crunched his anti-squat numbers. He gave me a call and said, "We can do this and get the best, most awesome anti-squat figures we've ever achieved, but there's no place to put a front derailleur!" At the time I'd already been working with Shimano on the Press-Fit 92 bottom bracket design and direct mount front derailleurs as a way of gaining extra real estate in that area. In the end it all came together and we were able to make it happen.

►► **How do your DW-link suspension bikes differ from other DW-link bikes (Ibis and Turner)?**

Starting with what's the same; all DW-Link bikes don't squat under power and they get great traction on the climbs. We all share quite a similar anti-squat curve. Beyond that there are big differences in leverage ratios, frame stiffness and general construction—just like a Norco is different to a Specialized.

With Ibis for instance; they are based in Northern California and part-owner Hans Heim used to be involved with Santa Cruz Bicycles along with the development of the VPP suspension system. His background and the terrain where they are based is very different. As a result their bikes have a different fit, feel and geometry.

Turner has his own unique take on it too. The Turner 5-Spot is a great riding bike but it doesn't feel like a Mach 5.7. He uses bushings, we use bearings; all our links are one-piece while his are all independent. It's just a very different way of approaching things.

Frame stiffness is something that I'm super-passionate about; it's a hallmark of our frames where it may not be at the top of the list for some of the other guys. It is certainly one of the key reasons why we went down the DW-Link route with its one piece rear triangle.

►► **Which bike designers or engineers do you respect the most?**

Ooh... I'd have to say Richard Cunningham and Mantis bikes; with their elevated chainstays and mixing different materials together. The mountain bike world wouldn't be where it's at today without some of the things that he put in place a long time ago.

I respect Jeff Steber from Intense; we were there in the early years both doing Horst-Link bikes and he's always been very progressive in testing all the downhill stuff and pushing the limits on where those bikes have gone.

I've also got to add Dave Weagle with his patents on the DW-Link, but I'm a little biased with this one...

They are the names that come to mind immediately but it's not just suspension engineers. I respect any bike designers who really push the limits of manufactur-

ing and come up with good ideas on how to do things.

►►Pivot seems to be a 'progressive' brand and was quick on the uptake with things like press-fit bottom brackets and direct-mount front derailleurs. Why were you quick to introduce them but comparatively slow to do 12x142mm thru-axes and post mount rear brakes?

Suspension forks moved to post mount as it allowed them to increase the strength of the magnesium casting. When Fox was working on it they showed me how much strength they were set to gain and how much weight they were able to remove from the lowers as a result.

On the front, the calliper really drives directly into the fork leg. Post mounting on the rear doesn't offer the same mechanical advantage, as the calliper is offset so far from the seat stays. I also had reservations about the manufacturing; a magnesium fork leg pops out of the casting, you machine it and it's done. Alloy gets welded and things move and pull out of alignment. At the time post mount facing tools weren't really in the marketplace and shops were likely to struggle with it.

Now that we've gone with the wider 12x142mm thru-axle on the rear, it made sense to integrate the post mounts. Sometimes an idea comes along that might be good three years from now but it's just not ready for prime-time yet and you don't want to put things out there that the shops

and consumers aren't set up to handle.

The 142mm axle was a similar case. I thought it was a great idea and pushed for it to happen from the beginning, working with Shimano to design the thread pitch and so on. However, three years ago there wasn't a wide enough range of hub and wheel options, so it wasn't a viable option at the time. Besides, our one piece triangulated rear end combined with a DT RWS 10mm quick release was already very stiff, so there wasn't a lot to gain by using a thru-axle.

I also wanted to use an integrated zero-stack headset on the Mach 4 to lower the front end and make the head tube fatter, but at the time most of the industry was still doing external headsets. Companies like Giant were able to come straight out with internal style headsets, as they are focussed on selling complete bikes, but for us as a frame manufacturer it's important to retain cross-compatibility.

I spoke with Chris King and said, 'If you don't address these other standards that are coming along, someday you may be out of the headset business.' He's hard to convince, a nice guy, but very set in what he wants. Anyway, he grumbled and asked that we send him the drawings and it went from there. We need ample companies supporting a system before it's introduced. We always want to drive improvements and innovate, but not if it creates frustration

when building a bike or leads to a negative experience for the rider.

New technology should be better in every way and not just a marketing tool. Product development should be done internally and not worked out by the end consumer. We'll sometimes see a new idea or technology pop up somewhere but you can't just jump on board and run with it. It may well be a great idea but we need to test it, work the bugs out and make sure it's got support in the marketplace. Only then can we create a product that will build trust with our customers and make their riding experience better in some way.

There are things that the big OEM brands can just introduce by making their own wheelsets, headsets or whatever, but this can leave the consumer in trouble if they can only use a dedicated Giant, Trek or Specialized part on their bike. For us, when we work on any new standard – I kind of think the word 'standard' is a bit of a joke – we really want it to become a real industry-wide standard. We need to ensure the industry is behind any new system and we never want it to be this weird thing that only Pivot does. That's the long answer to a short question...

►►Where do you see things going with carbon within the Pivot range?

You are going to see a lot more of it...

I can honestly say that for a bike designer, I've been more involved with carbon than most. I was about halfway through the development of our Carbon Racer-X when I left Titus. We moulded all of our own IsoGrid and ExoGrid tubing in-house, we also made Maxm composite parts and there were times when I was out laying up carbon tubes and working on a program that helped us get the lay-ups that we needed to change the torsion versus the bending stiffness on tubes. Currently we assist Spanish company BH bikes with the design

of their high-end carbon road product. So while we have only just released our first carbon Pivot, we already have a pretty extensive background in developing cutting edge composite frames.

With Pivot, we went with aluminium to begin with as carbon simply wasn't there yet—we could produce a better stiffness-to-weight ratio in aluminium. There are a lot of companies that jumped headlong into carbon and have fought through the problems. In contrast, I'm confident that every person who bought one of the original Pivots still has a really good bike that isn't old technology, and isn't going to fall apart on them. I've been saying since day one that we'll do carbon when we can get all the details right.

Pushing for as long as we did with aluminium has allowed us to get the second generation Pivot bikes to a very high level. We've bench tested a lot of the well-known high-end carbon frames and our alloy models are stiffer in the head tube and bottom bracket than just about anything out there. So with our Mach 5.7 we've got

a very high benchmark to beat. The carbon version comes in about 5% stiffer in all the key areas while being around a ¼ pound (113g) lighter—we really did take the alloy 5.7 to its maximum potential.

Now we're looking to build on that and you'll see more carbon product from us for sure.

►►Composite bearings or bushings seem to be gaining popularity of late, what do you think about them for suspension pivot applications?

I don't think there is a future with them. I've been through it all, like the Norglide stuff and we used it on the Horst-Link at Titus. I was a big proponent of bushings for some time, as cartridge bearings really aren't designed to go back and forth within a small movement range. But even if they weren't originally designed for the application, if the bike is stiffer with cartridge bearings and they don't squeak, then in the real world the bearings really are better. We also use suspension pivot specific bearing technology with extra balls and higher load capacities—they are actually designed to handle the back and forth movements that you see in suspension bike pivots.

►►Of late we've seen a number of brands utilising eccentric pivots within their suspension system. What are your thoughts on them?

It's just another way to skin a cat—a way to get from point A to point B and achieve a particular goal, but using an eccentric doesn't automatically make a bike better.

When we were developing the new Mach 5.7, there was an opportunity to put something in but I chose not to go down that route. Eccentric pivots tend to have their bearings packed into a relatively confined space where I'm more about making my suspension pivots big and wide for greater stiffness. I'm not going to say that there won't be an application for it someday and it's now an option that people are experimenting with.

►►You've only got one 29er in the line-up, which seems at odds given the momentum they've gained in the US. Is there a reason you don't have more?

We've got a good variety of models for a small company but we do have to pick our battles. I've got a lot of prototypes, a lot of things that I'm riding, and a lot of them are 29ers. There will be a 529—I'm working on it... We knew about the new Fox 34 fork over a year ago and that's when I started working on the 529 project.

Once everything is up and running smoothly with our current carbon product, we'll start developing other carbon bikes which means there'll probably be a carbon 29er some day as well.

►►You've been involved with 29ers for a long time, originally with Titus and now Pivot. Where do you feel they are going, will they make 26-inch wheels obsolete?

You go to Eurobike and every bike company has one in their range, yet there's probably ten 29ers sold annually in the whole of Spain. Germany is starting to look at it but it's still got a long, long way to go in Europe. They sell pretty well in Australia but it's still the tip of the iceberg. In the States 29ers are going absolutely ballistic.

The latest figures showed that around 60% of the new mountain bikes sold in the US are 29ers. There's still more potential for growth but I think there will be pretty good pendulum swing back. I was talking with a dealer the other night over dinner and we were joking about 29ers being the answer to everything; "Problems at home with your wife? Just get a 29er and things will be a lot better for you... Car not running so well; get a 29er."

That's how it is in the US right now and it's absolutely crazy! And then there's the e-mails; "Are you going to do a downhill 29er with Weagle? You guys could do a rad DH 29er!" You know, that probably isn't going to happen. With the DW-Link we've got good frame stiffness and we can get longer travel with lower bottom bracket heights than other bikes but I feel that pushing into the 135mm travel range is the upper limit for us with a 29er. With most other designs I'd suggest that 120mm is about the ceiling before things start to get stupid. Of course you never say never and technology moves on but 29ers do have their limitations.

At the moment you've got people who are relatively short, showing themselves onto 29ers that they've got no business being on, and they are making some serious compromises in the process just to ride a 29er. At some point these people are going to realise that it doesn't work that well for them. The Asian market is never going to be able to adopt the 29er the way that we have in the US—even though they may be asking about it. Some of our freeride guys call 29ers 'fun killers' because they lack the nimbleness of a 26er. Sure, we're trying to put that nimbleness into the 29er without using a super steep head angle but again it has its limitations. Eventually the novelty and the desire to make everything a 29er will subside—the situation will eventually balance out. They do have a key place in the market and 29ers do a lot of things really well; they are great in many XC and endurance racing applications, but it is not the answer for everything and everyone.

►►Do you still play a key role in product development with Shimano?

Not at the same level as I was before I started Pivot but I still provide input when there's a specific project like the 12x142mm thru-axle and we tested early versions of the XTR Trail brakes. I also get involved with SRAM in a similar way when they've got a new project that could affect our bikes; such as the GXP press-fit bottom bracket and S3-style direct mount front derailleur designs. We can build a better bike when we are involved as closely as possible with what's happening on the drivetrain, brake, and component manufacturing side.

►►Will we see electronic gear shifting on Shimano XTR?

Yes, I think we will. I believe it is only a matter of time.

►►How about the MTB drivechain; will the derailleur live on or does the future lie with some form of gearbox system?

Hammerschmidt was not a huge success and SRAM has informed us that we are not going to see a new Hammerschmidt any time soon. The chain remains the

most efficient way to drive a bike. Unlike a motorised vehicle, we don't have any extra horsepower to lose and currently all these systems impart both inefficiency and a weight penalty that isn't compensated for through ease of use, durability or hugely improved shifting performance. Besides, the chain and derailleur is far from the end of its development life.

►►So where are we likely to see major leaps forward in bike design?

I think that shock technology is where we will see huge gains. Have a look at what they are doing with Magnetorheological dampers on the Cadillac CTS-V or on Corvettes and Ferraris. The damper fluid has lots of tiny metal flakes in it and electromagnets can completely change the oil viscosity at a million times per second, taking the suspension from super firm to very plush in an instant. You could have a device mounted to your stem to manage all the electronic components on your bike; gears, suspension and so on... It's certainly achievable and I think it would be crazy if this technology didn't make its way into bicycle shocks.

►►What's your favourite bike and why?

I kind of have to pick two—sorry. I'd pick the Firebird and the Mach 5.7. On the right trail, the Firebird is the absolute funnest bike. If you've got the leg power to get up something, that thing will give you the traction. It's got incredible square-edge bump performance and great handling. Still, it's probably got a little bit too much travel for a do-it-all bike.

In the end the Mach 5.7 is definitely the bike that I ride the most. It does everything from a 24-hour race through to super-D—it's the perfect all-round bike and a lot of fun.

►►What's the best thing about being Chris Cocalis?

Well I've got a great family and a good company with great people working for me. I also get to go to a lot of cool places and meet people along the way.

►►What's the worst thing about being Chris Cocalis?

Maybe the jetlag—sometimes the travel schedule gets a little hectic.

►►Favourite beer and food?

I don't drink much in the way of alcohol—I'm more of an ice tea guy. For a while I was known for keeping Pepsi and Coke in business with a four-litre a day addiction that mitigated the jetlag. That wasn't good but I've changed recently.

Food wise you can't beat pizza or hamburgers, I don't eat much of that stuff anymore but it's still my favourite.

►►Are you a baggies or Lycra kind of guy?

Both, it depends on what I'm riding. I work on road bikes too and spend an equal amount of time in lycra—I've got my lycra on underneath my baggies right now!

►►What was your most memorable bike ride?

When I asked my wife to marry me! 

