
J Lucas Elrath

Bicycle Expert

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PROFESSIONAL EXPERIENCE

AFI Forensic - *Principal*

MARCH 2020 - PRESENT

Provide technical investigations, crash reconstruction, analysis, reports, and testimony toward the resolution of commercial and personal injury litigation involving bicycles, stationary bicycles and wheeled vehicle riders.

Bicycle Types:

- Mountain, road, cyclocross, triathlon, beach cruiser, juvenile, balance and learning bikes, folding, city, trekking, touring, single speed, fixed gear, electric assisted (e-bikes), bike share and fleet bikes.

Wheeled Mobility Devices:

- Design and assembly of wheeled transport devices including knee walkers, scooters and other devices that employ cable-actuated brakes, wheels, handlebars, hand grips, folding steering columns and other related components.

Bicycle Design:

- Standards, prototype creation, user testing, hazard analysis, owner's manuals, warnings.
- Framesets: geometry, relationship of frame dimensions to ride characteristics, materials selection for strength, safety, weight and cost, tube butting profiles, tube joining methods, rear hub spacing conventions, internal cable routing.
- Component selection: brakes (caliper, cantilever, side pull, drum and disc), shifters, bottom brackets, cranksets, gearing, chainrings, cassettes, forks, wheel sets, rims, spokes, handlebars, hand grips,

saddles, seatposts, derailleurs, suspension systems, dynamo lighting, electrical assist cables, bicycle rack design, e-bike battery case design.

- Retail display design: developed racks for the display and storage of children's bicycles and wheeled toys.

Bicycle Construction and Manufacturing:

- Steel and aluminum frame welding techniques, steel frame brazing techniques, carbon fiber composite frame and component manufacturing methods, cast and forged component manufacturing methods (stems, seatposts, drop outs, fork crowns, braze-ons), internal cable routing, steel and aluminum tube hydro-forming methods.

Bicycle Maintenance:

- Cleaning and lubrication for chain, front and rear derailleurs, suspension components, wheel, headset, bottom bracket and suspension bearings, derailleur pulleys, internally geared hubs. Rider fit modification, brake setup and ongoing maintenance (road caliper, cantilever, hydraulic and mechanical disc, roller cam and drum brakes), dynamo lighting system theory and operation, e-bike battery and motor troubleshooting, hydraulic disc brake bleeding, brake pad replacement, inspecting proper torque values for assembly hardware.

Bicycle Repair:

- Steel frame alignment and repair, wheel truing, inner tube repair. Replacement of: major components, wear items, control cables and housing, handlebar tape, grips and end plugs, clincher tires, tubeless tires, tubular tires, chain, cassette, chainrings, headsets, bottom brackets, rims, spokes, pedals, saddles and bearing systems.

Bicycle Shop Retail Operations:

- Gathered feedback for quality control issues from authorized dealers and relay to assembly factory. Performed regular dealer visits to discuss line changes, new designs, customer interactions, technical instruction, assembly and maintenance issues, and end-user instructions. Trained dealer employees on bicycle assembly, inspection, maintenance and repair. Trained dealer employees on customer interactions, conversations and instructions.

Rider Actions:

- Participation in fund raising rides, supported century rides, self-supported long distance touring, bicycle camping, cross-country mountain bike/motorcycle touring.
- Competition in USA Cycling road and track cycling races, MASS series mountain bike races, Wisconsin and PACX cyclocross races.
- Extensive urban commuting and utility cycling experience. Five years car free in center city Philadelphia averaging 4000+ miles per year.

Event Planning and Safety:

- Bicycle event and clinic ride planning and route selection. Assist bike shops and municipal organizations in planning bicycle rodeos to teach children safe riding techniques.

Skills Instruction and Guidance:

- Licensed by the League of American Bicyclists (League Certified Instructor) and by the International Mountain Bicyclist Association (Level 2 Skills Instructor) to lead guided tours and teach riding skills on- and off-road.
- Lead mountain bike trips throughout the United States including Utah, Michigan, Wisconsin, Delaware and Pennsylvania. Has taught skills to mountain bikers and road riders since 2000.

Motorcycles:

- Sport riding and adventure touring motorcycles.

Motorcycle Training and Experience:

- Completed Pennsylvania's Motorcycle Safety Foundation Basic and Advanced Rider course. Has held a PA motorcycle license endorsement for 20 consecutive years.
- Commuted and toured on several motorcycle models in excess of 80,000 miles.
- Completed a self supported 1000 mile tour in less than 24 hours. Planned and completed a 6 day 2750 mile solo tour of the western United States.

Robson Forensic, Philadelphia, PA - Forensic Investigator

October 2012 - March 2020

- Participated in over 250 investigations
- Qualified as bicycle and bicycling expert in both state and federal litigation

Trek Bicycle Corporation, Waterloo, WI - Product Manager

January 2011 - September 2012

- Responsible for product line planning and international juvenile bicycle market research.
- Provided vision to a design team of industrial and graphic designers, engineers and marketing associates.
- Tracked financial performance for a \$25 M international business segment. Visited Asian vendor factories to audit manufacturing capabilities and quality control practices.
- Performed hazard analysis and reviewed test results with engineering department for bicycle frames, components and complete bikes.
- Assured compliance of products to United States CPSC and European CEN safety standards.
- Interact with dealers to train employees on customer interactions, receive feedback from mechanics on assembly and technical issues.

Advanced Sports Incorporated, Philadelphia, PA - Product Manager

July 2008 - November 2010

- Conceived, edited and finalized bicycle frame drawings in concert with Asian vendors.
- Compiled and managed bill of material documents for ~85 distinct models within the Fuji, Breezer and private label brands.
- Developed a line of electric assisted bicycles in partnership with our manufacturer's research and development department.
- Traveled extensively to factories in Poland, China and Taiwan to supervise the manufacturing and testing processes.
- Participated in first article quality inspections of bicycles to trouble shoot assembly and finishing issues.
- Inspected warranty damage claims, incorporated data to improve product safety and quality

CREDENTIALS

E-Bike Fundamentals Certification - Barnett Bicycle Institute

Mountain Bike Instruction & Guiding, Level 1 – Professional Mountain Bike Instructor Association

Electric Bike Technician Certification Course Level 1 - Light Electric Vehicle Association

Certified Bicycle Technician – United Bicycle Institute

USA Cycling licensed: road, track, cyclocross, mountain bike, race official, race mechanic, coach

League Certified Instructor (LCI), League of American Bicyclists

Instructor Certification Program Level II – Basic Skills Instructor, International Mountain Bicyclists Association

EDUCATION

Temple University, Philadelphia, PA - *B.S., Electrical Engineering*

August 2000 - May 2004

Continuing Education

Safe Routes for Older Adults: Walking, Cycling, and Transit, Safe Routes Partnership, Washington, DC, 2020

Trail Marking Standards Across Varying Landscapes, American Trails, Redding, CA, 2020

Understanding Micromobility: Transportation's New Disruptor, Governors Highway Safety Association, Washington, DC, 2020

Everything E-Bikes: Understanding the Rules, Laws and Regulations of Biking's Fastest Growing Market, People For Bikes, Boulder, CO, 2020

Effective Wayfinding Signage: Trail System Planning, Design and Implementation, American Trails, Redding, CA, 2020

Making Connections: The National Digital Trails Network Project, American Trails, Redding, CA, 2020

Improving Pedestrian and Bicyclist Safety in Work Zones, Federal Highway Administration, Pedestrian and Bicyclist Information Center, Chapel Hill, NC, 2019

E-Bike Fundamentals, Barnett's Bicycle Institute, Colorado Springs, CO, 2019

Pedestrian Bicycle Crash Reconstruction, Northwestern University Center for Public Safety, 2018

Proactively Addressing Crash Risk with Systemic Safety Analysis, Federal Highway Administration, Pedestrian and Bicyclist Information Center, Chapel Hill, NC, 2018

Conducting Road Safety Audits, Federal Highway Administration, Pedestrian and Bicyclist Information Center, Chapel Hill, NC, 2018

Crash Types: Motorist Overtaking Bicyclist, Federal Highway Administration, Pedestrian and Bicyclist Information Center, Chapel Hill, NC, 2018

Multiple Threat Crash, Federal Highway Administration, Pedestrian and Bicyclist Information Center, Chapel Hill, NC, 2018

Technical Training, SRAM Technical University, Warwick, RI, 2018

Technical Workshop, Professional Bicycle Mechanics Association, Portland, OR, 2018

Fox Suspension Master Class, Appalachian Bicycle Institute, Asheville, NC, 2017

Designing for Bicyclist Safety (Parts I, II and III), Federal Highway Administration, Pedestrian and Bicycle Information Center, Chapel Hill, NC, 2017

Professional Repair and Shop Operation, United Bicycle Institute, Portland, OR, 2016

Carbon Fiber Composite Frame Building Course – Bohemian Bicycles, Tucson, AZ, 2015

Traffic Crash Reconstruction -2, Northwestern University Center for Public Safety, 2015

USA Cycling Bill Woodul Race Mechanics Clinic, 2014

Bicycle Assembly and Maintenance, Barnett's Bicycle Institute, Colorado Springs, CO, 2014

Spoked Wheel Lacing, Barnett's Bicycle Institute, Colorado Springs, CO 2014

Steel Frame Welding course, Metal Guru, New Paltz, NY, 2014

Pedestrian/Bicycle Crash Investigation, Institute of Police Technology and Management, Albany, NY, 2013

Park Tool Tech Summit, Washington, DC, 2013

Steel Frame Brazing course, United Bicycle Institute, Ashland, OR, 2012

PROFESSIONAL MEMBERSHIPS

Light Electric Vehicle Association

Professional Bicycle Mechanics Association

IEEE

ASTM Subcommittee F08.10 on Bicycles, voting member
League of American Bicyclists
International Mountain Biking Association
Professional Mountain Bike Instructor Association
Southeastern Pennsylvania Trail Riders

PRESENTATIONS

How GPS Data can be Employed in Bicycle Crash Investigation, CLE seminar
Retro-Reflectivity, Low Light Visibility, and the Sartorial Cycling Revolution,
Velo City Global Adelaide, 2014
A Discussion on Bicycles, Equipment, and Trails and Why They Fail, Florida
Justice Association, March 2014
Mobility, Safety and Visibility or How to Select and Equip the Ideal Winter
Bicycle, Winter Cycling Congress, February 2014
How Bicycle Design, Manufacture, Assembly and Maintenance Affect Rider
Safety, American Association for Justice, June 2013
Anatomy of a Motorcycle Crash, Florida Justice Association, December 2012

PUBLICATIONS

The CPSC and Me, Urban Velo, October 2013

EXPERT NOT RETAINED