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**RE: BICYCLE “STOP AND YIELD” LAWS SUPPORT PUBLIC HEALTH GOALS**

TO WHOM IT MAY CONCERN:

Recent interest in relaxing the regulation of bicycle behavior at stop signs, by allowing bicyclists to treat stop signs as yield signs via adopting versions of the “Idaho Law” (hereinafter “Idaho Law” or “the law”) in additional states beyond Idaho, has raised questions regarding the safety and efficacy of the law.

In my professional research of bicycle and pedestrian safety at UC Berkeley I have undertaken a multipart study regarding this heretofore open research question. **Best evidence strongly supports the universal adoption of the Idaho Law, in pursuit of numerous public policy objectives, including safety of all roadway users.** I summarize highlights of the findings to date in this letter.

ROADWAY SAFETY ENHANCEMENT

Before and After: No Harm in Adoption of the Idaho Law

A longitudinal study of injury and fatality rates in Idaho before and after its adoption in 1982, controlling for historical trends, was sought. Interviews in Idaho were conducted with authorities including police, legislators, transportation professionals, bicycle leaders of both recreational and advocacy groups, individuals involved with the original adoption of the law, and members of the general public. In summary these inquiries strongly supported adoption of the Idaho Law, and no entity whatsoever identified any negative safety result associated with passage of the law.

Idaho's Office of Highway and Traffic Safety (OHS) were contacted and were highly cooperative with the study; the OHS opened their historical data and allocated staff time to assist in this effort. Microfilm archives of police traffic incident reports from 1966 to 1992 were consulted over a period of days, and deemed too difficult to analyze; archival copies of statewide yearly summaries of traffic injuries and fatalities, including summaries of fatalities and injuries by county and by mode, were located instead as best available data.

**There is no evidence of any long-term increase in injury or fatality rates as a result of the adoption of the original Idaho Law in 1982.**

The *State of Idaho Highway Safety Plan, Fiscal Years 1981-1984*, which encompasses the period before and after the law was passed and implemented, stated that the injury rate for bicycles was constant overall and that “there is no evidence that [bicycle] fatality rates differ from the national level.”

Moreover, in the year following its introduction, **bicycle injury rates in the state actually declined by a substantial 14.5%** with no change in the number of bicyclist fatalities. While aggregate injury rates include numerous types of collisions,<sup>1</sup> the decline in injuries is consistent with the strong indication that the law actually improves roadway safety.

Comparisons with other Cities

The question of whether Idaho cyclists are more at risk than other cities in the present day was asked as well.

Additional, detailed electronic data in spreadsheet form was obtained from OHS for years 1997 to 2007 and used to compare Idaho's largest city, Boise (the state capital), with other cities.

In order to obtain a valid and meaningful result, it was critical to compare cities with similar bicycling patterns, cultures and environments, or results would not be meaningful; city X might appear to have two times the injury rate of city Y, based on the number of injuries by population, leading some to assume it is more dangerous than Y, yet in actuality city X could be two times SAFER per trip if it has four times the bicycling rates. In fact just that type of mistake has recently been made regarding the law: Erroneous conclusions stemming from misinterpretation of simplest data regarding the relative risk of bicyclists in Fairfax, VA compared to Boise, ID were recently used to abandon an initiative for adoption of the law there, which emphasizes the need to use careful methodology.

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1 Data for 1974-1975 showed that “Passed Stop Sign” was a contributing circumstance in only 5.4 % and 4.2 % of injury/fatality collisions respectively in Ada County (Boise). These collisions were primarily, if not entirely, involving motor vehicles (there were 15 and then 18 total bicycle injury collisions for *all causes* in those years, whereas there were about 3.7 times more, 123 “Passed Stop Sign” incidents, in total. Note that in one major study cited elsewhere in this letter (Hunter 1999) examining three major cities which did not have the law, bicyclist “ride-out” at stop signs accounted for 10.2% of bicycle crashes, and motorist ride-out accounted for about 60% more, for 16.5% of bicycle injury crashes. The study did not determine to what extent motorist confusion over bicycle right of way (which the law would assist in correcting) resulted in the higher number of motorists striking bicyclists who had right of way at stop signs, although that uncertainty is known to cause collisions and is another reason that the law improves safety. The fact that bicyclists are better able to choose when it is safe to ride-out definitely accounts for this difference as well. Driving out at stop signs was actually the #1 most common type of crash in two of the three cities studied.

Bicycling rates are difficult to come by to begin with and vary widely between cities, as do other factors indicative of risk (roadway types and roadway quality; presence of bicycle infrastructure; age strata; bicycling experience and skill levels; traffic volumes, speeds and conditions; weather patterns; etc.). Isolating any effect of the law by comparing cities with and without the law is a difficult proposition as there is much to control for and there are many unknowns.

An extended search for comparable cities to Boise was undertaken and comparisons were made with those cities using best available information. **All comparisons indicated that Boise was safer for bicyclists than other cities which did not have the Idaho Law.**

The closest comparison city utilized was Sacramento, California, also a state capital, which was comparable to Boise regarding many important factors affecting bicycling rates and injury rates including precipitation; topography; street layout (both being capital cities with numerous one-way streets, civic buildings and parks as well as gridded single- and multi-family residential districts); degree of development of a bikeways network, including the presence of a river with a bicycle path through the city; strata of populations of special risk (youths and college students); overall population and worker population; and more.

Using California SWITRS data, OHS data for Idaho, and erring on the conservative side against the law, Idaho nevertheless shown brightly as safer than Sacramento, with no fatalities year after year compared to regular fatalities in Sacramento, and a much more favorable injury rate year after year. Utilizing U.S. Census data, the best available source for actual bicycling rates between the two cities, **an injury-to-bicycle-commuter ratio was generated, and Boise was found to be 30.4 % safer than Sacramento.**

The primary difference identified between the two cities (and the other cities so compared) was the Idaho Law. To attribute Boise's enhanced safety to the law alone would be premature without further analysis, but **it is important to emphasize that this study found support in every other inquiry.**

#### EXPLANATION OF SAFETY BENEFITS OF IDAHO LAW

There are strong theoretical explanations for the safety benefits of the Idaho Law, which are corroborated by this and other research.

The law codifies existing behavior and makes that behavior the designated legal norm, which improves predictability and consistency and thus reduces risk.

Further support was found in a major study of bicycling behavior conducted in the late 1990's, employing video of almost 4,600 bicyclists, which found a dramatic difference in the percent noncompliance at stop signs between Gainesville, FL and Austin, TX.

Contrary to the expectations of opponents of the law, the Gainesville cyclists appeared roughly 2.3 times safer (combining both stop sign and red light running proportions). **“In Gainesville... many bicyclists ran stop signs, but ... motor vehicles had adapted to this behavior and crash risk was minimal”** (William W. Hunter, J. Richard Stewart, Jane C. Stutts, Herman H. Huang, and Wayne E. Pein, 1999).

### Support Defensive Riding

Bicyclists must ride defensively and rely on momentum for maneuverability to avoid collisions. The law allows bicyclists more choice in their ability to clear intersections quickly, avoiding the zone of risk. By affording bicyclists the right to choose to traverse intersections at times when traffic conflicts are unlikely, bicyclists escape their biggest risk factors. Roughly 75% of bicyclist injuries occur at intersections, where motor vehicle turning movements can surprise even experienced cyclists. In contrast, compulsory stopping makes bicyclists less maneuverable and forces them to spend more time in jeopardy even when it is clearly less safe to do so.

Conflicts of uncertainty occur when bicyclists and motorists have varying approaches to stops: some motorists wait as if the Idaho Law is in place, whereas others do not. Some cyclists stop in an effort to obey laws, only to find a motorist waiting. Collisions sometimes occur because of this uncertainty; predictability is enhanced when the rules of the road are consistent and sensibly provided, and with such predictability is borne safety.

Compulsory stopping, in hampering predictability, also robs bicyclists the opportunity to avoid conflicts with rear gaining motorists who do not expect them to stop, or who are impatient with bicyclists who happen to be lawfully in their way. Bicyclists attempting to be law abiding have been struck from behind due to adhering to well-intentioned but unexpected compulsory stopping behavior, and others report being harrassed and threatened for causing delays by compulsory stopping. In contrast, traffic flows are enhanced for all by the law.

### Air Pollution Exposure Reduced

Compulsory stopping also increases wait times at intersections, meaning harder-breathing cyclists suffer increased exposure to the higher concentrations of injurious pollutants from braking and accelerating effects and compounded traffic at intersections. Such pollution is known to cause cancer, nervous system damage, reproductive harms, and other diseases. Allowing cyclists to pass through intersections more quickly reduces their exposure to those concentrated airborne contaminants.

### Enhanced Perception and Collision Avoidance

Persons riding bicycles have much enhanced ability to see and hear to avoid collisions, and to maneuver and stop, than motorists generally do. In addition, bicyclists have a very strong

personal incentive to use those enhanced powers to avoid collisions, as bicyclists are not protected by seat belts, air bags, or an armored metal shell as motorists are. In contrast, injury rates of bicyclists and pedestrians increased when seat belts were introduced and again when air bags were introduced, which researchers attributed to increased feelings of safety leading to dangerous behavior on behalf of protected motorists; bicyclists do not enjoy that luxury.

## CHILDREN AND THE LAW

Children constitute a special risk category for bicycle safety. Concern that the law would result in adults setting a bad example for children, and/or would result in children treating stops as yields before they have reached the skill and experience necessary to do so, has been raised regarding the law. It is true that inexperienced and erratic behavior is common among child cyclists and clearly relates to their higher risk. However, **there is no reason to believe that the law would contribute to that risk, which is a separate public health issue.**

Indeed, in researching the legislative history of the law, an original letter was found dated March 16, 1982, from the State Superintendent of Public Instruction for the state of Idaho at the time, Jerry L. Evans, expressing opposition to the law due to a concern for school children who “do not have the maturity necessary to make such decisions.” Evans stated his office's “feeling” that “the law would tend to encourage unsafe and careless practices and habits.” However, on the very next day, the committee of nine legislators unanimously passed the law with a note in the record that, “I cleared with Jerry Evans and he has agreed to withdraw objections because of the effective date July.” It is important to note that in Idaho and elsewhere, children are taught to stop at stop signs independent of the law, allowing them time to learn the ability to choose when it is safe to yield.

Studies consistently indicate that it is *education and supervision* that makes the difference with regards to children's roadway skills and behavior, independent of law. There are many legal behaviors that bicycle safety instructors tell children to avoid for their own safety. In general children are ignorant of traffic laws and traffic safety until taught. It is unlikely that adult examples would change, given that the majority of cyclists continue to act in accordance with the Idaho Law.

That such fears exist is good in that inadequate attention is given to child bicycle safety; if concern over the adoption of the Idaho Law leads to more parental attention and more education in schools as a result of fears that children will not stop at stop signs, the net effect would be that children are again safer than without the law. However, the place to act is not in stopping the law but in providing the training and supervision that makes the real difference in child traffic safety.

Unfortunately, the United States have been remiss in providing adequate education and safety training to the public. The Netherlands, in contrast, is a far safer place to bicycle than the United States; one reason is that “by age 10, all schoolchildren have received extensive education on safe

walking and cycling practices...not just the traffic regulations but how to walk and cycle defensively...[which] is completely lacking in the United States.” (Pucher & Dijkstra, 2003). Any legislature concerned with the safety of children has the option of applying the law only to persons above a certain age; or of coupling the law with much-needed public health education to encourage more and safer bicycling behavior. Yet despite this lack of education for our children, **no evidence has been found that the Idaho Law has harmed children.**

## BENEFITS OF ADOPTION

A wide array of public health benefits, beyond the question of traffic safety, support the adoption of the Idaho Law. Besides improving public safety for all roadway users, adoption of the Idaho Law greatly improves level of service, legal protection and cultural acceptance of bicycling and so supports universal public policy objectives of promoting and increasing bicycling.

### Energy Conservation

The need to reduce the nation's reliance on finite fossil fuels for transportation is well known. The “peak oil” phenomenon is projected to continue taking a tremendous toll on the economy and on public health.

Compulsory stopping at stop signs requires a very noticeable increased expenditure of personal energy and greatly increases the time required for everyday transportation bicycling, reducing the viability of this petroleum-free transportation option, and thus discourages the use of bicycling. Saving everyday bicyclists personal energy translates into savings of petroleum which would otherwise be used.

### Cultural Support Increases Bicycling

Latest research strongly indicates that social acceptance and cultural support are significant factors in the choice to bicycle. By codifying existing widespread practice, adoption will reduce roadway hostilities and misunderstanding directed at bicyclists and help create peaceful coexistence on the roadways, helping society meet policy objectives and public health goals of increased bicycling.

If public policy goals are to be met, laws and legal enforcement needs to be consistent with those goals. Unfortunately, many bicyclists and bicycle advocacy groups complain of traffic enforcement stings directed at bicyclists who treat stop signs as if following the Idaho Law. Police represent the stings as safety interventions, yet as discussed here, such stings in fact have little to no relationship to actual safety.

Because bicyclists widely believe yielding at stop signs to be the established, safe, practicable and sensible behavior, the enforcement stings are in turn, widely perceived not as an effort to help bicyclists but as overtly anti-bicycling, an official expression of cultural rejection. (Advocacy

groups frequently note that bicycle police officers also typically roll through stop signs, plea that enforcement instead be directed at aggressive driving, and request that education efforts take a different form than essentially random criminal intervention.) Such negative interventions serve no one and work counter to public policy initiatives to increase bicycling.

### Daily Exercise Attainment

Increased daily exercise is a public health imperative, required for healthier, happier, and longer lives, especially important as our country faces an increasingly difficult health care crisis. Bicycling provides an efficient daily means of gaining valuable exercise while accomplishing routine tasks. Such activity protects aging populations from falling below the “disability threshold,” on the order of ten years on average. By creating more appropriate legal treatments of bicycling including adoption of the Idaho Law, bicycling will be elevated to its rightful place as a respected means of transportation which many more will be able to choose.

### Safety in Numbers

With increased bicycling comes safer bicycling for all, a fact now well-established in the scientific literature. By supporting increased bicycling with adoption of the law, all bicyclists are safer.

### Efficient and Safe Bicycle Routes

Urban bicycle routes, whether officially designated or unofficially adopted by individuals, are typically placed on residential streets with frequent stop signs. These stop signs are often not warranted by traffic conditions, but are posted by resident requests to serve the purpose of traffic calming; stop signs do reduce speeds and volumes of through traffic. Ironically, the signs help create the conditions for bicycle routes even as they serve as a barrier to bicycling. It is difficult to find such routes without stop signs, because they quickly attract arterial levels of through traffic. **Moreover it would be politically impossible and highly costly to remove these neighborhood stop signs, whereas changing the traffic laws to give an exception to bicycling costs nothing and supports residential goals of reduced traffic impacts.** The concept of *bicycle boulevards* was generated in part to endeavor to resolve this conflict.

### Prevent Repetitive Stress Injury

A known and increasingly well documented risk of repetitive stress injury from bicycling, including carpal tunnel syndrome and conditions dubbed “cyclist palsy” in the medical literature, is exacerbated by repeated hard stopping while operating a bicycle.

This risk factor is well understood from research in the field of occupational injury. By relaxing the legal requirement to make a hard stop at each stop sign, harmful stress on the body is

reduced: both to the upper extremities during a hard stop; and to the knees from repeated acceleration after a hard stop.

Bicycling allows gentle, non-impactive exercise for many who have few other options; whether for disability, back issues, knee problems, or other hindrances, many are unable to run or even walk. Some cannot drive but can bicycle. Aging populations are particularly at risk for losing their ability to exercise. By requiring repeated, unwarranted hard stops, which are very difficult on the body, we are precluding everyday exercise from persons whose very lives are in the balance.

### Healthy Heart Protection

Allowing smooth and continuous cardiac activity facilitates public health benefits by keeping heart rate elevated consistently; in contrast, sudden halting of physical activity carries an increased risk of catastrophic cardiac events including fatal heart attack, particularly associated with sudden stopping after the type of athletic exertion which some transportation, many recreational, and all competitive cyclists, commonly engage in.

### Climate Change Mitigation

Climate change threatens our very food and water supplies, increases morbidity and mortality, harms economies and much more. It is beyond dispute that anthropogenic carbon emissions have created this increasing disaster. Motor vehicle traffic accounts for roughly 50% of carbon emissions, exacerbating climate change in many urban areas of the United States. Switching to bicycling immediately reduces carbon emissions and thus can be expected to reduce the onset and severity of climate change. Adopting appropriate legal treatment of bicycling including the Idaho Law encourages bicycle use and thus is an essential step in mitigation.

### PRECEDENT

Precedent is also on the bicyclist's side. Only after some 50 or more years of use as a major transportation mode, including periods when the bicycle made up a much higher percent of trips than today, were bicyclists placed under the blanket rubric of motor vehicle laws on a state-by-state basis. Indeed, from an historical perspective, the idea of requiring bicyclists to stop at stop signs is relatively new, and many in the general public are unaware of these laws, which were adopted without an informed consideration of the social costs of such regulation.

Many countries, including developed countries, successfully relax vehicular laws regarding bicycling in the interest of public health and public policy objectives, most notably the Netherlands. While it makes sense to treat operators of bicycles as operators of vehicles, bicycling has unique benefits and characteristics which are not best served by broadly and indiscriminately assigning them the same constraints as motor vehicles. Likewise, there are instances when bicyclists are not allowed the same privileges as drivers of motor vehicles.



Currently, most states do not regulate pedestrians at stop signs, who enjoy right of way at unsignalized intersections, but do regulate motor vehicles. On the continuum of traffic safety, *the bicycle is a hybrid, representing the middle-ground*, between a pedestrian and motor vehicle. On the analogous continuum of regulation, best use of the bicycle indicates *also regulating at the middle-ground*: to yield.

## SUMMARY

No evidence has been found to indicate that the Idaho Law has resulted in any net detriment to the public; instead, a wide array of public health and other public benefits have been clearly identified. These benefits will accrue in any state which adopts a similar law. Restoring bicyclists' right to treat stops as yields is long overdue and in the best interests of the economic, environmental and public health of this nation.

Sincerely,

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**Nota bene: references, photos, and discussion of video and traffic speeds were work not included in this draft. Several related research papers are in various stages of publication.**