Tilman Bracher

Bicycle Crashes in Berlin

Surprising results of recent research work [1987]

Translation: John S. Allen

Auch auf deutsch erhältlich

In the past few months, three important reports have appeared which thoroughly illuminate the situation with bicycle crashes in Berlin:

- a crash study by the chief of police
- a “Report on the bicycle route network” by the Berlin Senate, and
- an investigation by Schreiber (the ("Schreiber-Gutachten") (1) , in which possibilities for improving bicycle travel in Berlin are examined as an assignment from the Berlin House of Representatives.

These investigations have now made it possible to evaluate the safety of bicycling in Berlin very well. Together, the three reports show that

- streets with sidepaths are more dangerous for bicyclists than streets without them;
- bicyclists are relatively rarely at fault in crashes;
- the police can regard children and elderly people as “primarily at fault”; and
- It is not a goal of the Berlin Senate to encourage more people to ride bicycles.

Since these somewhat surprising results became known, a lively discussion about interpretations of the results and the future of bicycling politics has taken place among the various authorities, and with bicyclists’ organizations and politicians.

1. Crash rates and severity

In 1986, 2776 bicyclists were injured in Berlin, and 11 were killed. While the total per year increased continually from 1153 to 2787 between 1970 and 1986, the number killed remained relatively constant at 14 per year, on average (Source: (2), attachment 5).

The percentage of bicyclists among all people injured in traffic in Berlin is the same, at 19%, as in built-up areas in the Federal Republic. Nonetheless, the situation in Berlin is significantly different: as the percentage of bicyclists in traffic is only about half as great as in the Federal Republic, bicyclists in Berlin are approximately twice as frequently involved in crashes leading to bodily injury; however, the consequences of reported crashes are, on average, not as severe as in the Federal Republic (source: (3) , Tables .3-4).

2. Sidepaths

It has been a declared political goal in Berlin since 1978 to build sidepaths in order to make bicycling safer. However, some advocates representing bicyclists have become bitter opponents of these sidepaths. This is understandable, because sidepaths lead to crashes and are difficult to ride on. The release last year to the public of an internal crash study by the Berlin police department (3) made it known that the crash risk for bicyclists on streets with sidepaths in Berlin is *significantly higher* than on streets without sidepaths.

That the risk of crashes on sidepaths is especially high, and that the ongoing program to build them has negative effects on traffic safety, are, nonetheless, disputed by the Berlin Senate. In its "Bericht über Fahrradverkehrsnetz" ("Senatsbericht") [Report on Bike Route Network ("Senate Report")] the Senate turns the conclusions of the police investigation on their head and attempts to defend the earlier, assumed "leap forward in safety" with the sidepaths.

After the internal police investigation into bicycle crashes was laid before the public last year, the ADFC obtained updates through official channels. Some facts: 49% of the 3,680 bicycle crashes recorded by the police in 1986 occurred on streets with sidepaths (source: (3), table 27). As to crash severity as well, streets with sidepaths do no better (percentage: 50%; source: (3), tables 37/53).

The great majority of bicycling is nonetheless on streets without sidepaths. This is clearly so, as only 18% of the streets have sidepaths, and the Senate's traffic counts show that many streets without sidepaths also have high traffic volumes (4).

There is also no statistical support for the assumption that bicyclists are better protected by sidepaths on heavily-traveled streets: hardly more than half of the arterial streets have sidepaths, and yet the crash numbers on the streets without sidepaths are no higher.

It may therefore be concluded that bicycling on streets with sidepaths in Berlin is *more dangerous* than on streets without them.

The more streets are outfitted with sidepaths, the higher the number of injured bicyclists. The situation is especially dramatic when compared over time: From 1981 through 1986, the number of bicycle crashes on streets with sidepaths increased by 133%, but on streets without sidepaths, it decreased by 8% (see Figure 1).

By far, the most commonly recorded other parties in crashes involving bicyclists on both types of streets – with and without sidepaths – are drivers of passenger cars (cf. figure.2; source: (3), tables 40/55).

Figure 1: Trends in bicycle crashes in Berlin on streets with and without sidepaths (source: (3)).

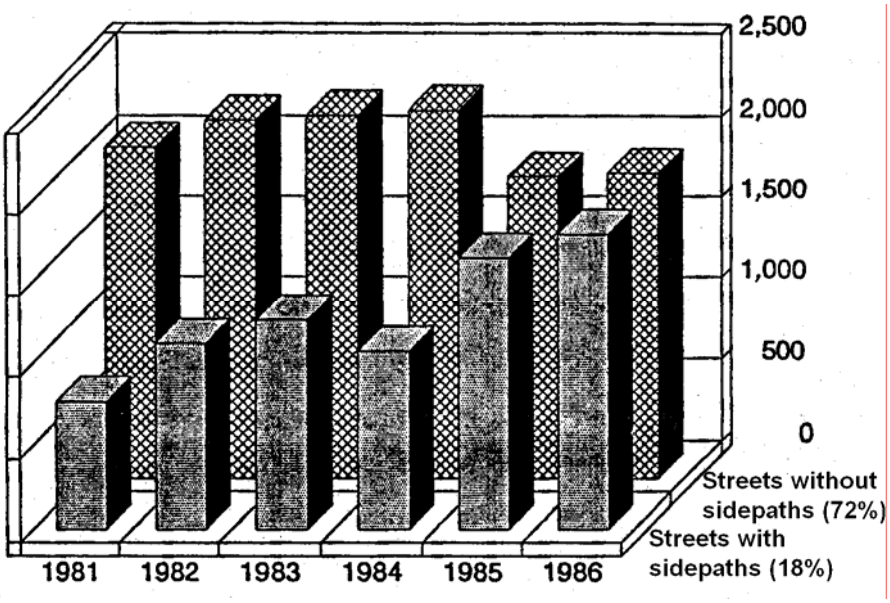
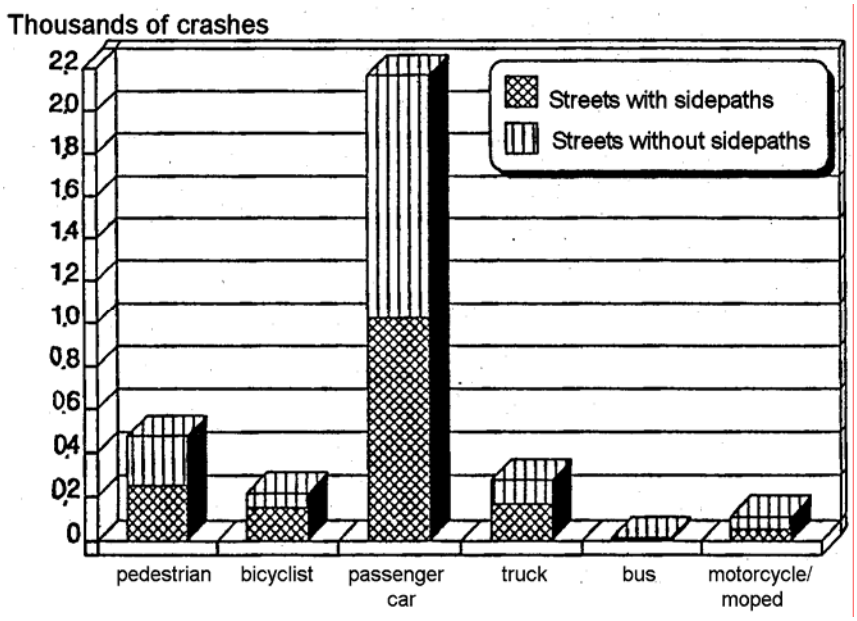


Figure 2: Other party involved in bicycle crashes in Berlin on streets with and without sidepaths, 1985 (source: (3)).



3. Causation in bicycle crashes

With the figure of 55% for bicyclists as primarily at fault in crashes, the Senate report reinforces the widespread public impression that bicyclists are at fault in most of their crashes.

The opposite is true. According to the police report, 58% of all bicycle crashes are caused by *another party*. With drivers of motor vehicles, whose collisions with bicyclists have, as a rule, especially serious consequences for bicyclists, the situation is even worse: The drivers of passenger cars are at fault in 62% of collisions, and the drivers of trucks, in 73% (source: (1), tables 15/16).

Only in 27% of all crashes are bicyclists in the “normal age range” between 18 and 65 recorded as “primarily at fault.” In another 15%, children under 18 years of age, or persons more than 65 years old, are recorded as “primarily at fault.” Among the 2787 injured and killed bicyclists in 1986, 672 (24%) were younger than 15 or older than 65 (source: (l), table l6).

The police’s regarding children and older persons as “primarily at fault” contradicts §3a of the traffic law, a section also hardly known to the public. This section requires drivers of vehicles "*to conduct themselves in such a way toward children, disabled persons and elderly persons so as to exclude endangering these travelers.*" As children also are very unlikely to be able to describe the conditions leading to a crash to a police officer as convincingly as a grown driver of a motor vehicle, children can be assumed to come off especially poorly in police statistics.

As, however, the causes of crashes recorded by the police do not include a category “negligent conduct toward children…,” it is apparent that the police either are not aware of this paragraph or consciously do not apply it.

Figure 3: Causation of bicycle crashes leading to bodily injury in Berlin, 1985.
as reported by the police

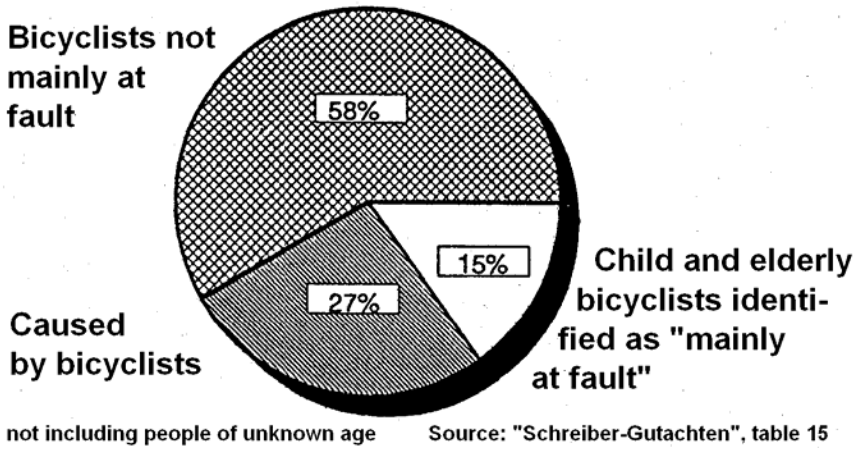


Figure 4: Causation in bicycle crashes leading to bodily injury, by age

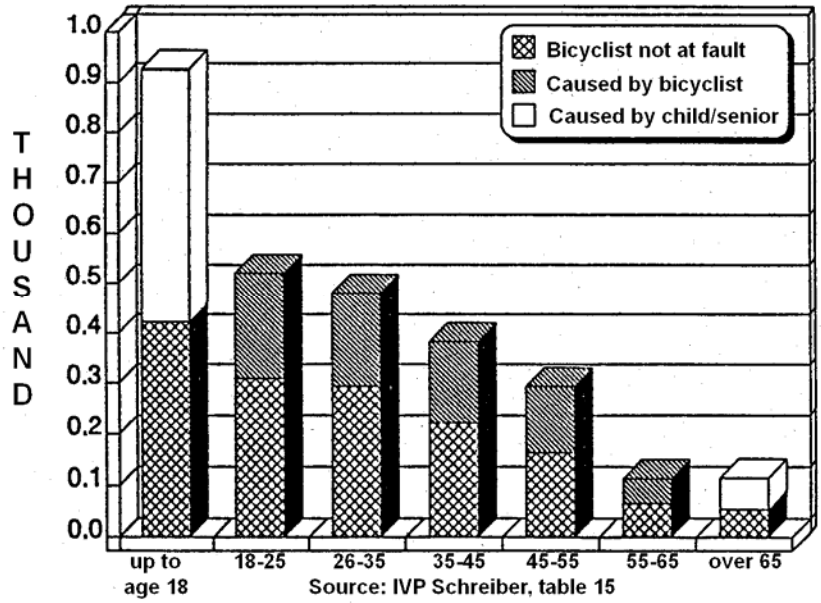
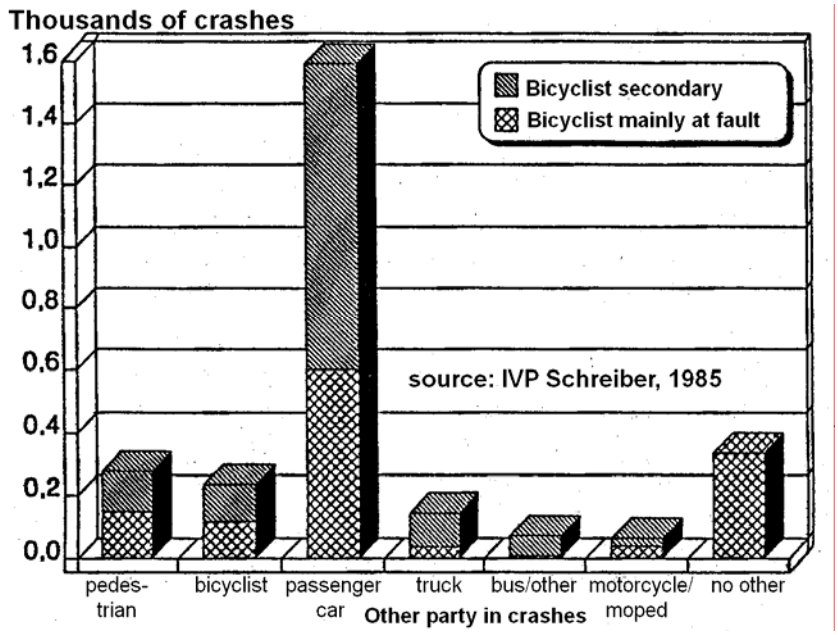


Figure 5 Causation in bicycle crashes, by type of participation in traffic (source:(1), table 16).



4. Causes of crashes, according to police data

The police data are based on reports collected by police officers immediately after a crash. Anyone who has had to deal with police officers in such a situation in Berlin as a bicyclist certainly does not expect that the data on bicycle crashes collected by the police are especially bicyclist-friendly.

The most common causes which police officers recorded on streets with sidepaths in 1986 were:

***Other party's causes*:** (source: (3), table 42)

Faulty right turn	469 cases	(38%)
Not heeding yield sign	132 cases	(11%)
Left turn with opposing traffic	119 cases	(10%)
Entry into moving traffic:	96 cases	(8%)

***Bicyclist's causes*:** (source: (3), table. 39)

Incorrect use of the roadway	353 cases	(42%)
Inappropriate speed	159 cases	(19%)
Errors regarding pedestrians	82 cases	(10%)

The police data confirm the well-known, typical crash types at intersections on streets with sidepaths, which occur because motorists do not see the bicyclists on the sidepaths, or fail to yield right of way to them. The Senate report, too, reaches the correct conclusion, that the "*most important conflict points and crash types … for the most part are due to inadequate sight conditions with regard to parked vehicles*" ((2), p.4).

Based on this conclusion, the Senate plans more sidepaths – though additional signs prohibiting stopping will be posted near intersections, in order to improve sight conditions. The ADFC, however, demands, instead, bike lanes on the roadway to the left of parked vehicles, rather than sidepaths, so that bicyclists will be in the field of view of motorists.

The Senate report does not further address causation by other parties, and anticipates no further measures to prevent errors by motorists. Nonetheless, the Senate report pays great attention to the cause "incorrect location in the street corridor", as reported by police officers responding to crashes. "Among the crashes caused by bicyclists, by far the most common cause is use of the wrong location in the street corridor."

The report gives the impression that if fewer bicyclists would avoid the sidepath, there would not be so many crashes. In this, it lends support to motorists who are annoyed by bicyclists on the street and who do not have an understanding attitude toward bicyclists who ride in the street in spite of an available sidepath. Bicyclists report that they are sometimes endangered by such motorists, who seek to compel them to leave the roadway by horn honking and close passes.

The "Schreiber-Gutachten", on the other hand, documents an entirely opposite situation. The bicyclists who are least often involved in crashes when using the "wrong part of the street corridor" are those using the roadway, not the sidepath.

Location of bicyclists involved in crashes (Source: (1), table 30).

On streets with sidepaths:

On the right-hand sidepath	84.2%
On the left-hand sidepath	7.4%
On the sidewalk	5.3%
On he roadway	2.1%
Crossing the roadway	1.1%

On streets without sidepaths

On the roadway	81.4%
On the sidewalk	15.3%
Crossing the roadway	3.4%

Unbeknownst to bicyclists, this categorization in the police data reveals a serious problem with bicycle traffic: a bicyclist who rides on the roadway or deviates onto the sidewalk when there is an available sidepath is automatically "in the wrong place." If an incident occurs, the bicyclist is,

then, as a rule, held completely or partially at fault, due to the mandatory sidepath rule – even if the risk of a crash in the "correct" place, on the sidepath, would have been higher, or even if only deviating onto the sidewalk for a short stretch because the sidepath is not continuously usable.

This makes it clear why bicycling advocates consider rescinding the mandatory sidepath rule as an important goal "das Muß muß weg!" [“The must must go!”]), and why sidewalks should, however, be open to slower bicyclists, through the installation of the supplementary sign "Radfahrer frei" [“open to bicyclists”].

The following causes are those most often recorded on streets without sidepaths in 1986:

Bicyclists’ causes (source: (3), table 54)

Incorrect roadway use	305 cases	(25%)
Insufficient safety distance	222 cases	(19%)
Entry into moving traffic	178 cases	(15%)
Inappropriate speed	135 cases	(11%)

Causes by others (source: (3) , table 57)

Getting in and out, loading and unloading	196 cases	(23%)
Entry into moving traffic	111 cases	(13%)
Faulty right turn	78 cases	(9%)

The Senate report, however, draws no conclusion from the list of causes. As the types of crashes on streets without sidepaths are “*fundamentally more diverse*” than those on streets with sidepaths, the Senate concludes that “*there are hardly any approaches possible for targeted improvements*” (source: (2), p.4). This statement rejecting improvements in the largest part of the street network, where half of all bicycle crashes occur, has led to outrage and protests among representatives of bicyclists.

Motorists’ “*Error when getting in or out, loading or unloading*” and bicyclists’ “*insufficient safety distance*” should be regarded as resulting essentially from the same cause, the endangering of bicyclists by maneuvers related to opening of doors, and getting in and out of parked vehicles. For this reason, the ADFC asks motorists to give more clearance to bicyclists, but also asks bicyclists on the roadway to ride farther from vehicles that are stopped or parked on the right. And we ask legislators to rescind the strict “keep right” rule. Striping should make the right lane on multi-lane streets either wide – more than 4m – or especially narrow, at most 2,25m, so that bicyclists can maintain at least on meter’s spacing from parked vehicles and motorists will either completely change lanes or allow sufficient clearance.

If police officers at a crash scene often report “inappropriate speed”, this means: in their opinion, bicyclists often ride too fast. This appears paradoxical, with an average bicyclists’ speed in Berlin of less than 10 km/h – but it becomes understandable from the perspective of a motorist, who, for example, has not looked, or looked soon enough, when turning right to see whether a

bicyclist is approaching on the sidepath, and is surprised by the collision. From the motorist's perspective, any bicyclist who travels at only half-normal speed is going much too fast. And that will be what is described in the crash report, either as the "primary cause" or often, as the second or third cause, or because there is a desire to place the bicyclist partly at fault for crashes.

The ADFC therefore demands:

- Design of all bicycle facilities to accommodate "normal" bicycle speeds: 30 km/h on level ground, and more on downgrades.
- * Harmonizing speeds on the roadway (for example, through "Tempo 30" or narrowing of the roadway.

"*Contraflow bicycle traffic on one-way streets can not be permitted, due to its extreme danger,*" writes the Senate ((2), p.7). As such measures have not yet been installed in Berlin, there is no information about them in the police data. The assertion disagrees completely with the experience of cities which have tried this measure. The police in Basel have opened almost 100% of one-way streets to contraflow bicycle traffic, with good results. Almost all typical bicycle crashes are avoided, because bicyclist and motorist can see each other early and from the front.

Figure 6: Recorded *bicyclists'* causes of crashes on Berlin Streets, 1985.

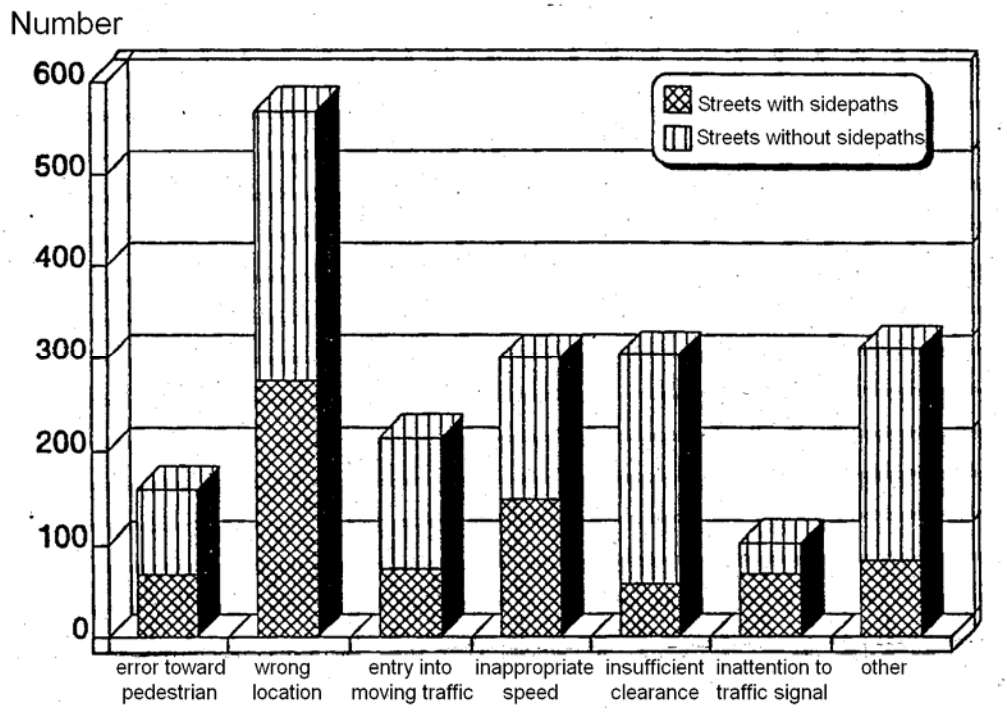
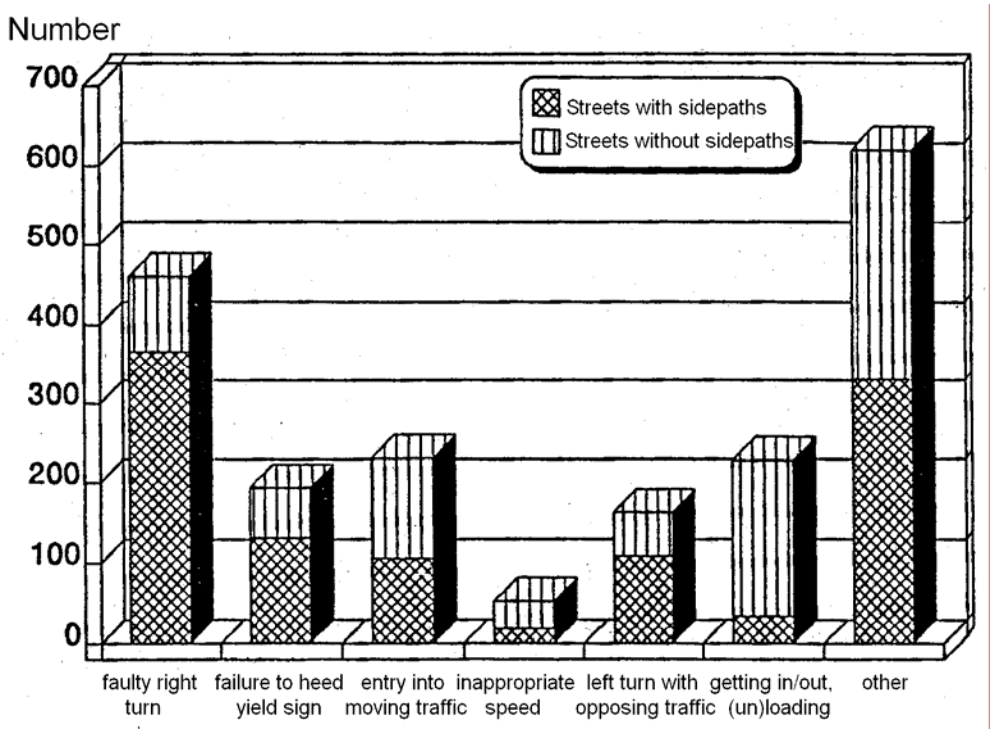


Figure 7: Recorded *other parties'* causes of crashes on Berlin Streets, 1985



5. Conclusions

The Senate report presently before us responds to a task assigned to the Senate by the House of Representatives, based on a proposal by the SPD initiated by the ADFC, and on similar demands by the Alternative Liste. The very end of the Senate report makes some suggestions about planning which the ADFC regards as positive - though not concrete, and includes a list of the ten bicycle routes now planned; but the preceding text makes it very clear that the writers of the report did not intend to encourage more Berliners to go over to bicycling by providing well for bicycle traffic.

The ADFC regrets that the Senate report on the possible design of a bicycle route network hardly makes use of the knowledge gained from the police report, or of the conclusions of the "Schreiber-Gutachten" - and still represents to the public that the type of bikeway design that preceded their publication as safe.

Nowhere is it described how a good bicycle route network that allows fast travel can induce motorists to choose bicycling instead, or that the encouragement of bicycling is especially important to improve environmental and living conditions in Berlin. It can only be hoped that the planned bicycle routes will not, once again, be so poorly designed, that it is not possible to ride fast, safely or comfortably, and that a real opportunity to encourage bicycle use will be wasted.

References:

(1) K. Schreiber et al., Verbesserungen für den Fahrradverkehr in Berlin (West) [Improvements for bicycle traffic in West Berlin], Berlin April 1987 ("Schreiber-Gutachten").

(2) Der Senat von Berlin, Bericht über Fahrradverkehrsnetz, Abgeordnetenhausdrucksache [Berlin Senate, report on the bicycle route network, Publication of the House of Representatives] 10/87, released December 17, 1987 ("Senatsbericht").

(3) Polizeipräsident in Berlin, Verkehrsunfälle mit Radfahrern, Berlin 1987 ("Polizeistudie") [Berlin chief of Police, Crashes Involving Bicyclists (the “police study”)] (with analysis of crash data through 1986; the corresponding internal crash analysis through 1985 was published by the Grüne Radler Berlin, Cheruskerstr. 10, 1000 Berlin 62.)

(4) Senator für Verkehr und Betriebe, Erhebungen zum Fahrradverkehr September 1986, Ergebnisbericht [Senator for Traffic and Industry, bicycle traffic counts, September 1986, summary report], Berlin 1987.

******

The author of the present document is active in traffic research, a member of the national leadership of the German Bicycle Federation ADFC, publisher of the ADFC’s"Forschungsdienst Fahrrad" [Bicycling Research Notes] and author of "Konzepte für den Radverkehr" [Concepts for Bicycle Traffic] (Bielefeld 1987).