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THE CONSTRUCTION OF FEDERAL HIGHWAYS IN SWITZERLAND

When in 1958 the Swiss overwhelmingly adopted, by popular vote, a constitutional amendment on the construction of roads, a new and promising phase of road planning was inaugurated, by which the construction of federal highways is bound to benefit most. Up to this moment, all authority over the road system had resided with the cantons, and this meant that 25 different sets of concepts, guiding principles and goals ruled over the construction of roads, although a certain degree of co-operation was achieved by the granting of federal subsidies to certain projects. Now the planning, construction and financing of federal highways are given a common foundation.

Preliminaries

It goes without saying that the planning of super-highways, with all the technical problems it involves, dates farther back than to the year 1958. For about a decade, special committees of the Association of Swiss Road Experts had publicized the newest technical developments of road construction through information sheets and thus made a wider circle of interested persons familiar with these problems. Since 1954 a federal planning committee has been working on the solution of the technical, financial, legal, economic and organizational problems arising from the construction of federal highways. An extensive report of this committee, outlining the preliminaries and the technical procedures of such a project and, above all, giving a detailed survey of the choice of possible routes, was recently published and has been met, apart from the inevitable minimum of objections, with approval.

Switzerland's Road System

The network of strategic roads constructed by the Romans fell into decay in the Middle Ages. Only in the last century and during the first decades of the present one, Switzerland acquired a system of main and secondary roads adequate to the density of population and the intensive agriculture. But with a few exceptions, modern motor roads connecting the main population centres were lacking. Still, it has to be said that Switzerland's secondary and connecting roads were developed to a degree often envied by her neighbours. The central arteries, however, which so far have been missing, can only be created by the construction of federal highways. This new network of roads is to include, by 1980, a total of 1,045 miles of federal highways of the first, second and third class (about one third each, according to present estimates) and about 38 miles of urban motorways,

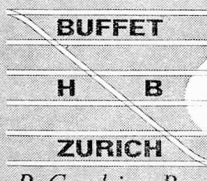
requiring 5,928 acres of cultivated land, 740 acres of forest country and 740 acres of unproductive land. The costs of this project, which is to be realized by two main steps, are estimated to-day at 4 billion Swiss francs, most of which will be covered by federal revenue from customs duties on gasoline imports.

The planned network of federal highways, in some spots already under construction, is to consist of twelve single routes; most important are the connections Geneva-Lausanne-Chur-San Bernardino, Zurich-Lucerne, Lausanne-Valais and the "Jurafusslinie" following the foot of the Jura mountains. At Geneva, Vallorbe, Basel, Schaffhausen, St. Margrethen, Chiasso and Sempione these routes join the European network of super-highways, thus securing the direct connection with Switzerland's neighbours and her position as an important transit country.

Traffic and Planning

By the year 1980, which serves as the basis of present plans, a total of 1,000,000 motor vehicles, namely 200,000 motor-cycles (including scooters) and 800,000 automobiles, are expected to roll on Switzerland's highways, the degree of motorization amounting to 1 motor vehicle per 5.5 inhabitants. It is probable that this figure will be reached earlier, for it seems hardly likely to-day that the growth rate of the last 15 years of about 50,000 motor vehicles per year will sink in the near future. In addition to cars registered in Switzerland, an average of 2.5 million foreigners with motor vehicles have come to Switzerland during the past years, who, together with frontier-crossing commuters, have contributed sizeably to the worsening traffic situation. Although super-highways will not mean the end of all traffic problems, they hold out the prospect of safer, smoother-flowing and easier traffic in the future, if coupled with a good system of secondary roads.

The general routing of the federal highway network was determined by considerations of zoning and traffic planning, but many efforts and a great deal of compromise had to be made to settle the local details. Not only the few variants at all possible in the hilly and densely populated Mittelland (the country between the Alps and the Jura mountains) had to be found and studied closely, it was also necessary to consider objectively the existing economic and regional planning requirements and those arising from road technicalities. All the same, it was not always possible to fulfil the well-meaning desires of communities and individuals; to have a high-capacity road close at hand, but (please!) not in the backyard or through their own land.



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On the technical side, demanding requirements are placed upon the new roads, for they should make driving, even in mountainous areas, fast, safe and effortless. For the first-class separated federal highways, two lanes 23 feet wide, with a 1 foot 8 inches shoulder on each side, a 13 foot separation band and continuous 8 foot pull-off strips are foreseen, which along with the 817 yards curve

vehicles; they are largely free of crossings and only accessible at special junctions, but the traffic is not separated by a middle band. The third-class federal highways will admit all forms of traffic, but despite this, the traffic will flow smoothly with only the least possible number of crossings. While many second-class highways are built as a preparatory stage, that is until the traffic

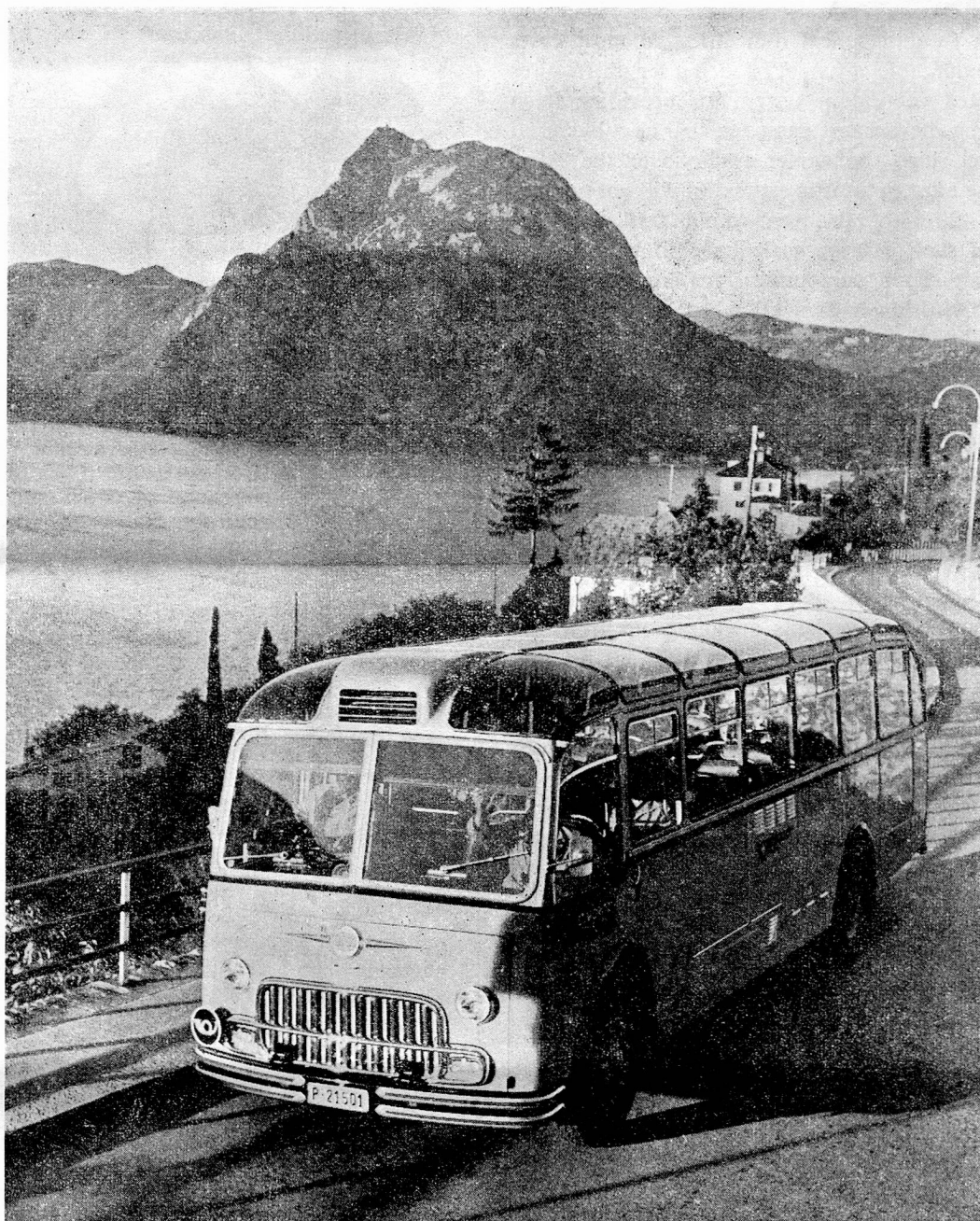


Photo: Swiss National Tourist Office

radius and a maximum grade of 3% promise a new high in road construction. It goes without saying that these streets will have no crossings and that all junctions will be marked with proper lane and speed indications. The second-class federal highways also allow only motor

warrants their being made into super-highways (first class), third-class highways will mostly be built in the Alps where super-highways are out of the question. The present class division does not rule out that certain routes, depending on the development of the traffic volume, will be put into

a higher category even before road construction begins; in some places, plans to this effect already exist in various stages of development.

Alpine Tunnels and Motorways

Without the construction of Alpine tunnels, a year-round connection of motorized traffic with the South is hardly possible; the length of possible tunnels, depending on the altitude chosen, varies somewhere between 3 and 6 miles. Apart from technical difficulties, in most cases eventually surmountable, a tunnel of such a length requires a special adapted ventilation system for providing fresh air and removing the exhaust gases, as well as a balanced lighting system. Since the winter traffic over the Alps, according to the most optimistic estimates, will not amount to more than 20% of the year-round traffic, capital expenditures of such a large scale have to be carefully considered. Only three communications are at present under serious discussion in Switzerland, namely the Great St. Bernard (already under construction) and the San Bernardino (most access roads existing) with the St. Gotthard remaining the classic passage.

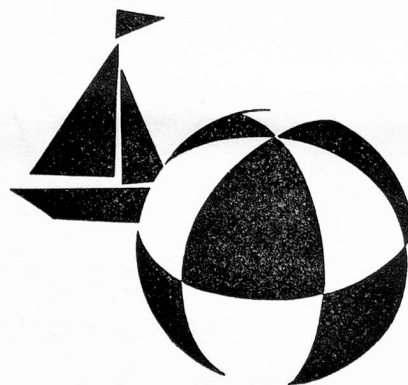
While an Alpine tunnel has a pure transit function, connecting distant traffic sources by the best route, motorways have the purpose of leading the traffic from the super-highways and from the areas surrounding the cities into the heart of the cities. Here the routing is largely dictated by the main directions of a traffic which generally is of a local nature, for variants advantageous from the point of view of terrain or costs will simply not be used by the vehicles if they do not follow the desired routes. Taking into account the increased difficulties and costs of construction and also the lower traffic speeds on such roads, minimum radii of 330-550 yards and grades up to 6% (possibly with by-pass lanes) are admitted on first-class motorways, and the separation can be narrowed down to a minimum of 3 feet. Even if the general road system here outlined will not solve all traffic problems, neither at the time of its opening to the traffic nor later, it will nevertheless fulfil hopes for safer, easier and more effective traffic on our roads.

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