



The Dynamics of School Location and School Transportation

Illustrated with the Dutch Town of Zwijndrecht

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The yellow bus is the icon of school transportation. Traveling to school, however, is a complex undertaking, not always defined by icons—school systems have many levels, corresponding to the ages of the students, and the ages of the students, in turn, correlate with different means of transport.

The interrelationship is not static. The school system may change, along with the spatial distribution of schools, which may change as a result of aging structures, demographic shifts, or even consumer preferences. Ideas about transport, traffic, safety, and security also may change.

The Dutch town of Zwijndrecht illustrates these remarkable dynamics. Dutch school transportation is not representative of the European Union. The member states differ in education policies and in school-related transport policies.

For example, in the 1970s, Germany enlarged its schools, not realizing that the necessary bus transport would cost billions of marks per year. As a result, Germany later left smaller schools alone and built cycleways to restrict the volume of bus transport, which it transformed largely into public transport.

Changes in School Transport in The Netherlands Since 1985

- ◆ Economizing on public transport.
- ◆ Economizing on school transport.
- ◆ Raising standards for school transport quality.
- ◆ Decreasing access to school transport.
- ◆ Increasing local car mileage by 75 percent.
- ◆ Expanding cycling facilities for shorter and longer distances.
- ◆ Introducing “sustainable safety” policies.

In contrast, Belgium historically has favored larger schools and has a vast school transport system. Belgium, however, hesitates to promote cycling because of the high accident rates.

School System and Transport

The Dutch school system has three main levels:

- ◆ Primary or basic—5 to 12 years old;
- ◆ Secondary or midlevel education—12 to 18 years old; and
- ◆ Tertiary or higher education—18 to 24 years old.

Students at the higher education level can travel independently—most have a driver’s license and move to the town where the school is located.

There are two types of primary schools:

- ◆ The basic school, which serves small settlements, so that walking and cycling—independently or under guidance—become the dominant transport modes; and
- ◆ The special basic school, which serves children with learning and behavioral problems; these schools are located in moderately sized regional centers and require organized transportation, especially for rural areas.

Children with other types of problems attend specialized schools organized in clusters and available only in larger regional centers. These require organized and sometimes specialized transport.

Secondary education has a more complex structure, with different levels, sublevels, and curricula. The primary distinctions are

- ◆ General education, in a grammar school or Gymnasium—which teaches classical languages—

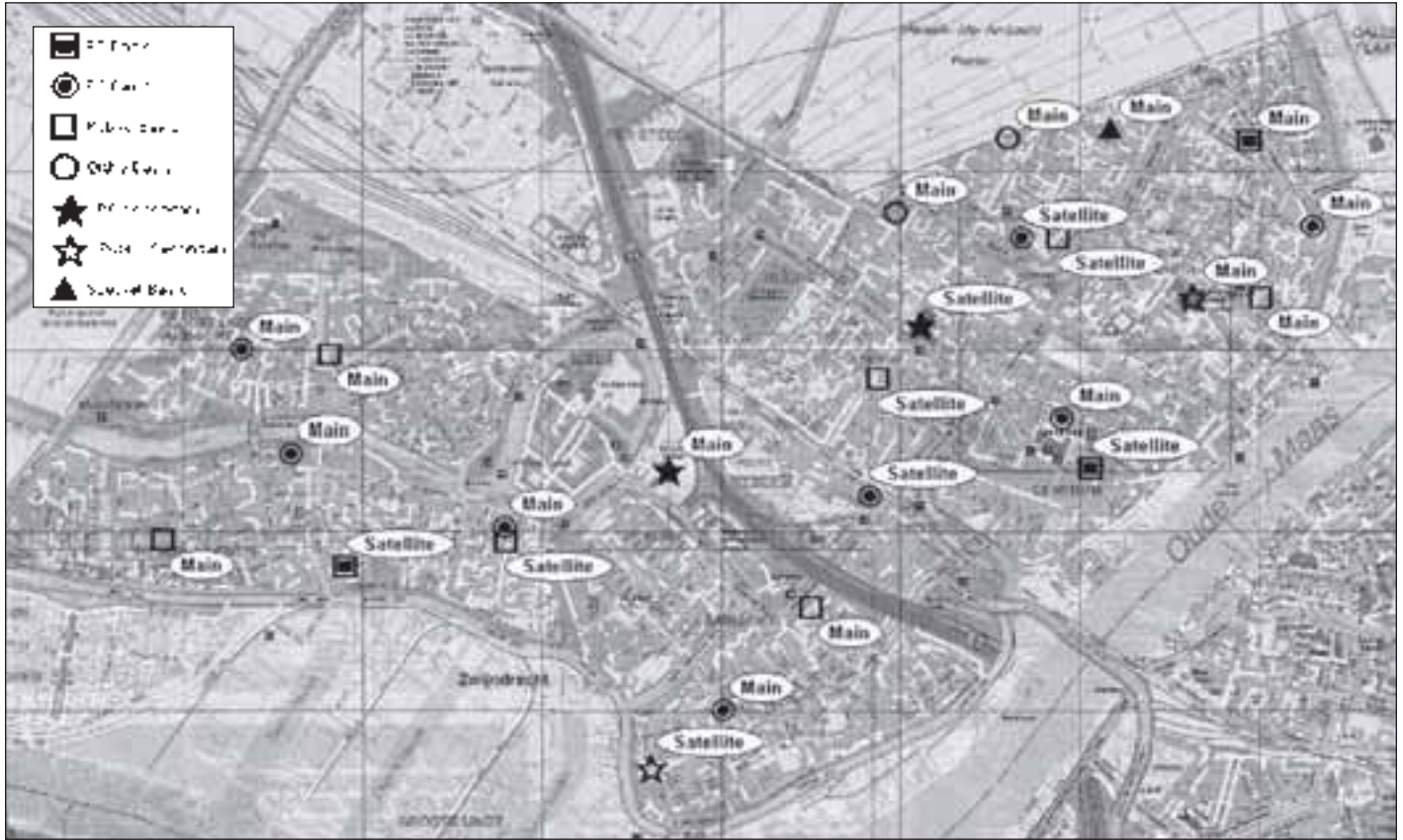


FIGURE 1 Locations of schools in Zwijndrecht. (RC = Roman Catholic; PC = Protestant Christian; Ortho = Orthodox Protestant.)

preparing students for higher education and for university.

- ◆ Vocational or practical professional education at two successive levels: preparatory and senior secondary.

The common types of secondary education are available in modestly sized regional centers; Gymnasia are located in larger centers; and special types of vocational education—for example, in shipbuilding and forestry—are offered only in a few locations.

Students mainly rely on cycling; at the age of 16 years, some switch to mopeds. Less than 30 percent of students use public transport. In larger rural areas, however, education is the most important motive for travel by public transport. Separately organized school transport is rare, occurring mostly in rural locations that are trying to attract students from urban areas.

Dynamics of Zwijndrecht

Zwijndrecht is a town of 43,000 in southeastern Randstad Holland, a circular zone of urbanization that includes the nation's capital of Amsterdam, the government center of The Hague, and the port of Rotterdam. In Zwijndrecht, the dynamics of primary and secondary education—even without senior sec-

ondary-level vocational schools—makes the prediction and solution of transport problems a challenge (see map, above).

Zwijndrecht is the largest of the suburbs of the ancient town of Dordrecht, southeast of Rotterdam, on an island between branches of the Rhine. The conurbation, called Drechtsteden, or Drecht towns, includes 250,000 inhabitants.

Zwijndrecht was developed largely after World War II. The city area borders a remarkable international infrastructure: the main shipway to Germany; the main highway to Belgium; and the four-track rail line to Belgium and southeast Holland. Under construction are a cargo rail line to Germany and the High-Speed Link South, connecting to France's passenger network. This development has created several barriers between the older north side of the town and the south side.

Secondary Schools

The town has two competing institutions for general secondary education and preparatory vocational education: Develstein College and Walburg College. Both are named for small castles that once stood on the then-separate Zwijndrecht Island.

Develstein offers Protestant education. Walburg is nonreligious. The schools have administrative boards—



The special education unit of Walburg College, in the building of a former primary school.

a foundation and a public body, respectively. Both are financed by government, with the cost of education borne by the national Ministry of Education.

The schools offer slightly different types of education. Develstein offers no Gymnasium education, although the school recently applied for government financing to do so. Walburg offers no technical preparatory vocational education. Both schools have several locations, some in neighboring towns.

Develstein College has a total of 1,530 students, with 1,040 enrolled at the main campus, south of the highway, in the highest levels of general education, including preparatory vocational education. A former technical school in the northern part of the town houses lower levels of theoretical and practical prevocational education. A satellite school in the neighboring town of Hendrik-Ido-Ambacht, with about 30,000 inhabitants, offers lower levels of prevocational education to local students.

Walburg College, with a total of 2,200 students, serves 1,000 students at the main campus, north of the highway in the new town center. Only a high level of general education is provided at this facility. The building needs an extension.

A settlement in the town of Barendrecht supplies similar education to 635 students, and two settlements in Hendrik-Ido-Ambacht provide the lower levels of prevocational education. A former primary school in Zwijndrecht houses the lowest level of the program (see photograph, above).

Despite the integration of the different kinds of secondary education into single institutions, geographic integration is lacking. Walburg College has separated the lower layers from what might be called its core program of general pre-university education.

The municipality of Zwijndrecht has developed a plan, working with the two local colleges, to reduce the number of school locations by moving students from the three locations in Hendrik-Ido-Ambacht to Zwijndrecht for practical preparatory vocational education. Both colleges then would share a local education center. Neighborhood residents, however, protested the expansion to 1,050 students.

Transport Consequences

The transport consequences of integrating the schools into larger units did not receive consideration. The planned physical relocation is unlikely to cause changes in travel mode choice. Students cycle for distances up to 5 kilometers year round (1), and the school journey is unlikely to exceed that distance. Moreover, public transport is insufficient and therefore is not an attractive alternative.

Traffic safety is a concern, however, because the daily cycle mileage for local secondary education—already a massive 2,500 round trips—would increase by about 10 percent. The 12- and 13-year-old cyclists are vulnerable because of inexperience in heavy traffic. The lengthened cycling distances would take a toll in accidents.

Cycling Measures

The Dutch national traffic policy strives for “sustainable safety,” creating conditions that counter the risk of crashes. In urban areas, traffic zones are distinguished from “traffic calming zones.” In traffic zones, motorized traffic is separated from other traffic and may travel at 50 kilometers per hour (km/h); in traffic calming zones, the speed limit is 30 km/h.

Zwijndrecht has separate cycling facilities along its main arteries (see photograph, below). In converting to the sustainable safety system, the municipality separated the two car lanes on Queens Road, the old town axis, and reduced traffic on Walburg Avenue, which continues to the Hendrik-Ido-Ambacht border, from four to two lanes.

Some intersections were cut off; others were provided with miniroundabouts, slowing cars to less than 50 km/h. Surrounding neighborhoods, which have mostly grid-like street layouts, were designated as 30-km/h zones. The general introduction of the principle may take more than a decade.



New cycle lanes and a pedestrian crossing at Steenen Kamer school.



Father and daughter leaving the new Volgerlanden school complex via Welhorst Avenue racing course; the cycle path is closed.

The separate cycle facilities along the roads were expanded to serve the routes to the colleges. Students from Hendrik-Ido-Ambacht will be able to reach the Zwijndrecht local education center almost completely on the separate cycle facilities; some intersections, however, remain dangerous.

The Zwijndrecht transport plan emphasizes cycle traffic (see photograph, above). Separate cycle facilities will be expanded, especially for routes to Barendrecht and the small town of Heerjansdam. School itineraries will receive special attention.

Traffic rules are not taught systematically in school, and misdemeanors such as cycling on sidewalks or traveling in the wrong direction on roundabouts occur frequently. On early winter mornings, police often fine students who have cycled between Hendrik-Ido-Ambacht and Zwijndrecht without the required headlamps or lighting. Police regularly inspect the safety condition of bicycles at the school gates.

Every September, the national traffic safety organization 3VO launches a nationwide campaign with the slogan, “We are going to school again,” to alert automobile drivers to the return of schoolchildren on cycles.

Special Education

The one school for special basic education in the town, Steenen Kamer (which means “stone chamber”), is a nonreligious school administered by a foundation that operates two other schools in the Dordrecht suburbs. The school recently extended its scope to include children with learning disabilities, in cooperation with the primary schools in the area. The school building was expanded from 6 to 9 classrooms, and further expansion to 13 classrooms is foreseen.

The transport implications are modest. The influx from the school’s area in Zwijndrecht and Hendrik-Ido-Ambacht has increased. The exchange of pupils with schools in Sliedrecht and Papendrecht, across the River Noord, has introduced commutes of 15 kilometers and more.

Distances and Costs

A pupil’s home municipality is responsible for providing organized transport to school. Until recently,

children under 10 years old were entitled to support for the journey to a religious school of choice that is farther than 4 kilometers away on “the shortest passable road”—the equivalent of an hour’s walk. For students who require special education, the minimum distance to qualify for travel support was 2 kilometers.

These standard distances, however, have been raised to 6 kilometers because of costs. Many parents may have difficulty bringing their children to school over such distances. Zwijndrecht, however, decided to retain the 2 kilometers standard for students in special education; the 6 kilometers standard for other schools went into effect without consequences.

The municipality must assign an appropriate type of transport, after consulting with each school. Public transport is preferred for children who are mentally and physically able to use it; if necessary, parents should accompany the children. If the journey by public transport takes more than 1½ hours, and if the commute can be reduced to less than half the time, special transport must be provided. These rules are strict, but if special transport must be provided for one or two children, municipalities will assign the remaining seats to other students.

The bulk of the cost (€600,000 annually) is for transport to the more specialized schools in larger towns. Municipalities often cooperate in organizing this transport, usually under contracts awarded after competitive bidding. The contracts, however, make few stipulations about quality and safety.

Transport Volume

The volume of transport often precludes the use of large buses, which would take too much time to collect a full load. Most special transport is provided by minibuses and taxis, which pick the children up at home. Steenen Kamer has parking spaces reserved for the small school vehicles.

Previously, only children 10 years old and up had to be provided with a seat. In this way, three children between 4 and 10 years old could be seated on two seats, and those under 4 years old did not need a seat—they could sit in a lap.

Complaints about this arrangement were many: for example, children could roam around the vehicles, sit on the floor, or even open the doors while the vehicle was in motion. Since January 2004, each child must be provided with a seat and a seatbelt, which must be fastened during the ride. This has increased the cost of transport considerably, leading to the 6 kilometers standard.

A national project to establish municipal advisory councils for pupil transport started in 2003. Including representatives of the parents and supported by orga-

nizations for the disabled and for traffic safety, the councils channel complaints and promote general quality. Funds were not available, however, for developing a quality instrument or measure, which remains on the agenda.

Primary Education

The freedom of education is a remarkable tradition in Holland. The coexistence of religious and nonreligious schools is a result of the “Pacification of the Schools Struggle” in 1917, which gave religious schools the same rights as public municipal schools.

Zwijndrecht includes four public, one Catholic, six Protestant, and two orthodox Protestant schools. The town has more school locations than schools. In successively developed town quarters, schools were located according to the number of children and were spread more or less evenly but seldom accommodated more than 200 pupils.

In most neighborhoods, after one or two decades, the population ages, and the number of children declines. Schools can fall below the subsistence level, particularly when standards for a minimum school population are raised (2).

In the early 1990s, the Ministry of Education raised minimum enrollment for Zwijndrecht schools to 177 students. Several schools were too small to continue. Amalgamation with a school in another neighbourhood, however, could preserve local education, creating a single school with more than one location. In Zwijndrecht, for example, the Catholic Toermalijn School has its main campus in the Walburg II quarter and a satellite in the village of Juliana. The locations are far apart, and these are the only schools in each quarter.

The municipality’s integrated school plan for 2004 anticipated a shortage of classrooms in some schools, but vacant classrooms in others. The municipality therefore may recommend moving schools or parts of schools. The standard maximum distance for relocation is 2 kilometers.



Picking up children at the new Volgerlanden school complex; in bad weather, car use increases.

School Facilities

Municipal responsibility for cost-effectiveness stimulates the concentration of schools into one building, as well as the agglomeration of schools into shared facilities. Another trend is the development of schools by different institutions, to offer day care for preschoolers and after-school facilities for children who cannot go home before 5 or 6 p.m.

Two noteworthy examples are the recently opened Roerdomp facility and the Volgerlanden school. At Roerdomp, a Protestant primary school was expanded to house a satellite of a public school, a day care center for retarded children, and an institution for handicapped pupils.

Volgerlanden is a developing residential area, with 4,500 homes in about 2 square kilometers, filling the gap between the urbanized areas of Hendrik-Ido-Ambacht and Zwijndrecht. Only one school is planned, with 44 classrooms in four semidetached buildings: two primary schools and two satellites of other schools. A fifth building will house additional services. Some of the buildings will be convertible into dwellings when pupil numbers decline.

Mode Choice

The traditional spatial distribution of schools for primary education had made walking the dominant mode



Margriet primary school, located at a roundabout with a highway access road.



Disconnected neighborhood access road near Margriet primary school.

Small-scale long-distance school transport at the Liberated Reformed school.



of school travel. This is still the case for most schools.

Biking is relatively modest, in part because schools that have insufficient space for bicycle storage discourage cycle use for distances less than 500 meters. The intent is to stimulate walking, but the policy instead may stimulate automobile use. Cycling at the orthodox Protestant schools, however, reaches levels of 50 percent, because students come from longer distances.

Schools in residential areas have no special parking facilities, and even modest levels of car use may cause chaos and raise safety risks near the school. New schools, like those in the Volgerlanden area, register higher levels of car use—up to 50 percent—partly because of longer travel distances. The parking lot at Volgerlanden (see photograph, page 15), with a capacity of about 30, is not sufficient, although a local shopping mall nearby offers ample parking space.

Travel to the nearest school may require many children to cross main arteries—for example, if the school is located on the other side of the road. The Margriet location of Juliana school is in a commercial area on a roundabout with a highway access road as one exit (see photographs, page 15). Because crossing is unavoidable, a conspicuous crosswalk on the main artery should maximize visibility for car drivers; in addition, the school can assign crossing guards.

Transport Measures

These circumstances make organized school transport rare, except for orthodox religious schools. The Liberated Reformed school draws students from the

largest area, using several types of vehicles, including two touring cars, to bring 80 pupils from the province of North Brabant, about 25 kilometers away (see photograph, left).

Traffic safety receives great attention, because 38 percent of crashes involving children occur on the journey to and from school. The trip to school is a classroom subject, concluding with a traffic exam. In addition, student itineraries are analyzed with support of the national traffic safety organization, and parent volunteers are trained to spot and solve traffic problems near the school.

Zwijndrecht has created special pedestrian crossings for school itineraries. The normal configuration is a zebra-striped crosswalk marking, a middle island to enable crossing in two phases, and a conspicuous warning sign. School entrances are fenced to prevent students from running out onto the street. In some cases, traffic wardens provide surveillance.

Practical Solutions

Administrative, financial, and institutional changes, as well as changes in consumer behavior, have an impact on population concentrations, school location policies, and school travel and transportation. Creating a range of educational choices at a single location raises the disadvantages of long journeys and of large concentrations of students.

The study of school transportation must master this confusing universe and indicate the quality and cost implications of location and transport decisions. The study of school transportation should produce practical solutions.

The province of South Holland wanted to quantify the concept of “reasonable distance” for school travel, cited in the secondary education law. The province favored a distance of 15 kilometers—that is, 1 hour by bicycle. Research, however, suggested a standard that was the product of minimum school size—then 240 students for a 4-year curriculum—and a maximum travel time of 60 minutes for a single trip as the travel time budget. Schools that exceed this budget, according to the findings, should consider new locations or faster transport (3).

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