

Road landscape development in Latvia up to the 21st century

Kristīne Vugule, Simon Bell and Ilze Stokmane *Latvia University of Agriculture*

Abstract. With the increasing use of roads for transport in recent decades, people frequently experience road landscapes and they have become a part of the everyday life of many people. The road landscape has developed in close connection with roads and their management. Historical events, life style and the priorities of society are reflected in it.

Road landscape design theory was developed in Latvia during the Soviet era, but there are few recent studies on road landscapes and this field needs more attention.

The road landscape is influenced by changes in state policy, economics, changes in land ownership and land use. Aesthetically valuable landscapes and landscapes with high heritage value can be lost as a result of these changes. It is necessary to develop a system of road landscape evaluation, to assess the current state of existing road plantings and road landscapes at a wider scale, to define the most valuable and endangered road landscapes and to develop action plans for road landscape planning and management at a state, regional and local level.

Research on road landscape development in Latvia can provide new knowledge and a basis for further planning of road landscape development. The main attention is paid to roads outside cities and villages. The study was carried out through analysis of literature, data and materials from the Latvian road museum. It includes photo materials from research on Latvian landscape seen from the road carried out in 2012 and 2013.

Keywords: Road landscape, alleé, tree row, roadside plantings.

Introduction

With the increasing use of roads for transport in recent decades, people frequently experience road landscapes. Many roads form part of an important cultural environment together with their surroundings. The road landscape in general has developed in close connection with the road itself and all road landscapes have a historical context and background. During the Soviet era, from 1945 to 1991, road landscape design theory was developed and applied in Latvia. Studies into factors influencing road landscapes such as road safety [11, 5], spatial planning [17], impact of roads on the environment [6] have been carried out since 1991 to today. There are few if any recent studies focusing on road landscapes in particular and this field needs more attention.

The aim of the study presented here was to collect and summarise information about road landscape development in Latvia up to 21st century. It consists of a literature review and analyses of data and materials from the Latvian road museum and includes photographic materials of the landscape as seen from several sample Latvian roads collected in 2012 and 2013. Research into road landscape development in Latvia can build new knowledge and provide a basis for further planning of road landscape development.

The results of the study

The first unpaved roads

Many Latvian roads are several centuries old. Old chronicles from the 13th century mention important roads in the territory of what is now Latvia. Today these historical routes can be traced by old trees which served as landmarks along the road, such as the

Kaive oak near Tukums or the Zauska pine near Smiltene.

Important post roads crossed Livonia and Courland during the 17th century. 29 post roads are recorded on maps of the Duchy of Courland (Fig. 1). The post system was enlarged in the 18th century after the territory of Livonia and Courland was added to the Russian Empire.

Roads in the modern sense of surfaced routes capable of withstanding traffic all year round first emerged in the middle of the 19th century after the Russian Empire started to build strategic roads from St. Petersburg to Warsaw through Rezekne and Daugavpils and from Pskov to Riga, Jelgava and Taurage [1].

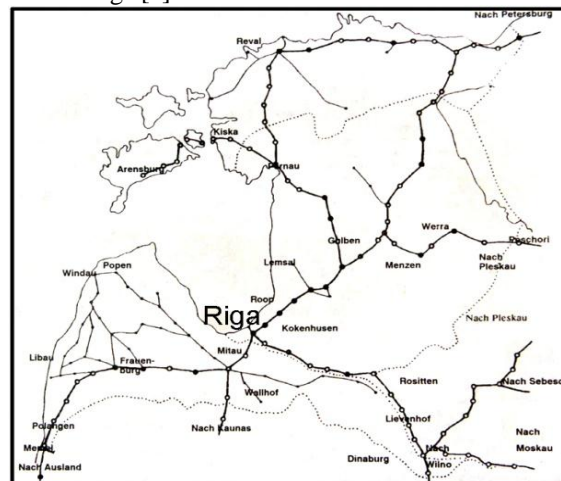


Fig. 1. Map of post routes and post stations in Courland, Livonia and Estonia in 1831
[Source: Latvian road museum].

Old engravings of the period show the beginning of roadside landscape development during the 18th century, when the first alleés or avenues were planted along the entrance roads to manor houses from the point where they left the highway [16].

The first roadside plantings were arranged to protect pedestrians and drivers from the sun, wind and heavy rain. Alleés or roadside rows of trees also performed practical functions. They prevented the roadside soil from drying out and protected the roadbed from the influence of wind and water. Usually the older alleés were planted on the road shoulders and occasionally behind the roadside ditches. Trees were planted close each together and formed crowns with dense foliage [16]. Tree rows also marked the edges of the snowbound roads in winter. Plantings to prevent snow drifting appeared in the 19th century for railway protection and later on similar plantings were located along the main roads.

The period 1919–1940

The foundation of the Road and Building Board in 1919 marks the beginning of the Latvian road industry.

There were few plantings to be found along Latvian roads at the beginning of the 20th century according to the statistical data. After the First World War only 434 km roads managed by the state were planted with trees and bushes. Road landscapes were mainly influenced by the Forest Day activities in 1930s. These were started in Varakļāni in 1928 on the initiative of the district forester Pēteris Purviņš in order to plant a city boulevard [4]. Table 1 shows the number of trees planted during the Forest Days.

Many alleés along roads were planted using different trees species, like alleé along the section from Tukums to Birzule, cherries from the Lithuanian border to Ventspils, birches along the main road from Riga to Jelgava and a 60 km long cherry allée between Rudbarzi to Skrunda and Saldus [16].

At the same time the road engineer Silenieks described the experience of road landscape design in Western Europe and Germany in the journal “Road traffic” in 1930, where alleés were replaced with tree groups because of safety problems associated with the increase in driving speed [13].

Latvian road engineers learned about road planning principles in connection with the landscape from other countries. Attention was also paid to tourism and the way tourists saw the country [3]. Several tourist roads were built, see Table 2.

TABLE 1
Data about the first category state road tree planting
[Source: journal “Road and Traffic” Nr.1, 1930]

Year	Length in km	Number of trees planted
Up to November 18 1918	434	64 000
From November 18 1918 to spring 1935	66	13 000
1935 spring	484	78 000
1936	446	60 000
1937	283	35 000
Total	1713	250 000

TABLE 2
Data about tourist roads
[Source: journal “Road and Traffic” Nr.13, 1940]

Road section	Length, km	Cost, LVL
To Staburags	3,5	12 000
To Gaiziņkalns	1,5	9 000
To Dēliņkalns	0,9	3 000
Tauleskalns near Krāslava	1,3	2 000
Tietiņezis (on the right bank of Gauja river)	1,4	4 300
To Zilaiskalns	1,0	500
To Skaņaiskalns near Mazsalaca	3,2	400
To Cesis sanatorium	1,8	10 000

The period 1945 - 1991

First decade after the Second World War was spent in the reconstruction of destroyed roads and bridges. Many of the road plantings had also been destroyed. In parallel with reconstruction work improvements to the public transport sector were carried out. More than 14 million roubles were spent on road landscape design after the war. In the first years after the war the care of the road landscape was in the hands of road foremen or repairmen [16]. Existing allées were replanted and new decorative plantings made. Many of them are still present along the roads (Fig. 2).

In 1948 Forest Days were re-established. The main organizer was the Council of Ministers of the Latvian SSR. The name was changed to “Forest and Garden Days”, but the action was prohibited in 1968, being considered to be a bourgeois remnant [4].

There were different views about road landscape development until road landscape planning theory was developed. The work was planned in several main directions:

- the aesthetic formation of road landscape and the placing of new roads in the landscape;
- improvements to traffic safety in such a way that different road plantings did not disturb visibility

and did not cause accidents, prevented road snowdrifts, protected agricultural land from car exhaust fumes and reduced traffic noise;

- carrying out nature protection measures by solving surface water drainage problems, preventing soil erosion and pollution;
- building bus stops and car parking and resting places [1].
- roads plantings were classified according to their functions and tasks:
- engineering and operational tasks (strengthening of slopes with vegetation cover, protection against snow);
- increasing safety (road visual perception reinforcement, preventing drivers from being dazzled by the sun);
- road aesthetics (screening of unsightly views);
- biological, agricultural and forestry tasks (improvement of microclimate, reducing the risk of forest fire) [14].

Road landscape design principles were summarised for the first time in Soviet literature by Aleksejev, Babkov, and Cokolskij in 1947. The organization of the Latvian republic “Latavtoprojekt” started to design roads in connection with landscape in 1959. Cooperation between engineers and architects helped in spreading landscape ideas among road designers. However, the introduction of landscape design principles into road planning was delayed because of missing instruction materials and the prevailing opinion that landscaping was too expensive and over-beautified the road. Landscape principles were reflected in Soviet normative literature for the first time in 1950 mentioning that “The road has to blend with relief forms. The road axis should be perceived as a line the placement of which depends on surrounding landscape”. These design regulations were included in SNIP II-D.5-72 „Roads: Design regulations” as recommendations [2].

Debates for and against roadside trees and avenues, their impact on road reconstruction and possible actions continued in the 1970s. One of the recommended solutions was to design a new road leaving the original tree rows to one side of the new road, as was widely practiced in the Democratic Republic of Germany.

Techniques for the replanting of large trees were successfully used in road reconstruction (Fig. 3). Trees from previous railway protection plantings were often used. They were dug up in late autumn shortly before the frost and replanted when the soil around the roots was frozen. Trees with roots up to 3m diameter and those which grew three or four together in a clump were transplanted this way. This technique was used in the reconstruction of the road between Riga and Bauska where planting of tree groups was planned.



Fig. 2. Decorative apple trees along the road Jelgava – Eleja [Source: photo by author, 2012].



Fig. 3. Tree planting in the road section Pļaviņas – Madona – Gulbene, 1960. Roadside with spruce hedge in background. Foreman Madona CER 10 Kārlis Āboliņš and Osvalds Tauriņš [Source: Latvian road museum].

Large trees were replanted from alleés (Fig. 4) using a variety of techniques, for example holding tree rootballs together in covered boxes or replanting them when the root balls were still frozen. In cases when it was necessary to widen the road, trenches were made and trees were moved away from the road by 3 to 5 metres. It was necessary to get permission from the Ministry of Forestry for tree cutting or replanting [14].



Fig. 4. Digging out trees from alleés, 1970
[Source: Latvian road museum].



Fig. 5. Bus shelter type "Б-1", 1960ts,
architect V. Reinfelde and engineer Gunārs Binde from
the institue "Ceļuprojekts" are sitting on the bench
[Source: Latvian road museum].

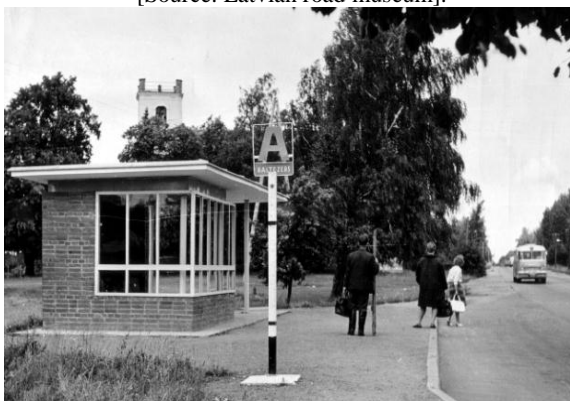


Fig. 6. Bus shelter near Baltezers on the road
Riga - Tallin, built in the beginning of 60th,
photo of 70th [Source: Latvian road museum].

In the 1960- and 1970s special attention was paid to the appearance of the road and road user comfort. Work on the refurbishment of bus stops was planned and carried out by the road administration. It was possible to choose from a variety of centrally offered solutions that minimized individuality of road design features.

The design institute „Ceļuprojekts” developed different individual projects for rest areas, and bus shelters (Fig. 5 and 6).

One can see the scope and course of development of these activities from an overview of results achieved in the 70ts (Table 3).

In several road maintenance and construction departments local tree and flower nurseries were set up in order to implement the road landscape improvements in the Soviet era [16].

After evaluation of experiences from other countries, Latvian specialists reached the conclusion that small rest areas along main roads and tourist routes were necessary every 10–30 kilometres. Rest areas were classified as:

- places with a view point and wide panorama;
- places with facilities and attractive landscape;
- parking places – rest areas with raised areas for car inspection [5].

In addition the following techniques were also used in allée reconstruction:

- trees endangering road safety close to the road and those on the inner side of road curves were felled;
- new groups of mixed trees were planted at the beginning and the end of the allée;
- breaks in allées were made in winding and hilly sections of roads;

An important aspect of road plantings were the hedges designed to protect the road from snow drifting. Spruce trees were mainly used. These plantings were extensive in open areas and in places where the road went into cuttings (where snow drifts could easily block the road). The first plantings were placed crosswise in 2 rows spaced 1 to 1,5 m apart, 17 to 20 m from the road and they were cut at 2–3 m in height. Such hedges could last for 50 years [16]. Technical regulations for snow protection plantings were developed which envisaged several types of hedges, mixing rows of different trees with various types of bushes [4].

TABLE 3

Data about the refurbishment work for road users
[Source: Andrejsons V. Laikmeti un ceļi. Latvijas
autoceļu nozare vēsturiskā skatījumā. Rīga: AGB, 2004]

Built	Year 1971, number of elements	Year 1979, number of elements
Car parking places	46	221
Rest areas	20	126
Bus shelters	826	1 260
Enlargements of bus stops	1 884	4 270
Benches at bus stops	5 967	9 060

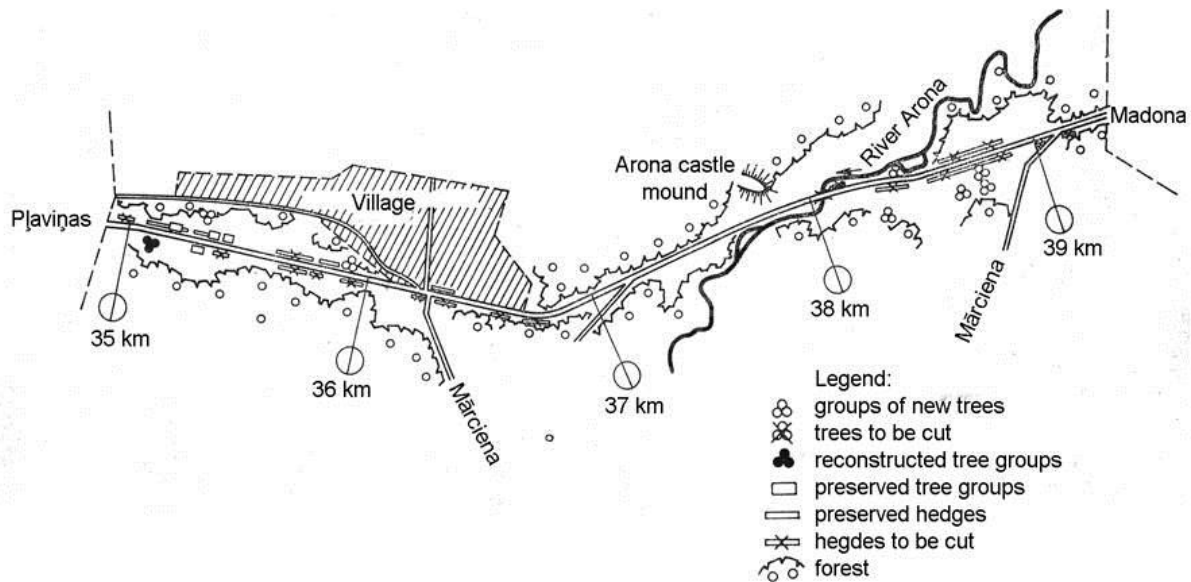


Fig. 7. The reconstruction project for the Arona river valley landscape in a section of road Pļaviņas – Madona – Gulbene [11].

Complex road and landscape design projects were carried out during road reconstruction. The first experimental project was for the 60 km long road between Pļaviņas and Madona (Fig. 7). Several other projects in the sections of the main roads between Rīga and Jūrmala and the Rīga- Pleskava road close to Rīga, were carried out after the experience gained elsewhere.

The main tasks were:

- to remove bushes that restricted landscape visibility, taking care of trees of great value;
- planting new decorative plants in farmyards
- to maintain existing avenues, to cut out dead wood and plant new trees of the same species

- to rehabilitate former quarries as agriculture or forest;
- to demolish derelict buildings, to cut down orchards which had lost their practical and decorative value,
- to improve the visual flow of the road by planting groups of trees or shrubs
- to tidy up the bus stops, make decorative plantings , erect bus shelters ;
- to build rest areas with tables and benches, fire places, toilets etc.;
- to carry out roadside forest maintenance cutting down dead wood;
- to maintain the elevations of buildings close to the road.

The period from 1991 to the present

The Ministry of Transport currently plans, organizes and co-ordinates road development policies nowadays. The state joint stock company „Latvijas Valsts ceļi” administers the road network. Roads are managed by their owners – the State, municipalities or other owners. Design, construction and maintenance work is carried out by private contractors.

The road landscape is influenced by road law, which regulates road use, administration, protection and development [19]; laws concerning protection zones [18] and rules about the regular maintenance of state and municipality roads [21]. These laws regulate actions along roads, limiting new road planting and tree cutting over a 100 m wide zone from the road centre line. The wider-scale road landscape can be influenced by the territorial plan.

The economic situation of the state and finances allotted to the road sector have influenced the road landscape since 1991. One of the main priorities of

the road industry is road maintenance, while the technical conditions of many roads are poor [8].

Checking of the technical conditions of the road and monitoring elements along the roadside is carried out once a year, roadside grass is regularly cut, but trees are maintained only in the cases when they interfere with electricity lines close to the road or when trees fall and disturb the traffic (see Table 4). There are very few new plantings.

Changes in the structure of land ownership resulting from land reform of 1990 have also affected road landscape development. Many rest areas have been removed and not renewed during road reconstruction due to property rights. Uncoordinated activities by land owners, conflicts and lack of action is reflected in the road landscape. Particularly noticeable is the situation on minor roads, where roadside ditches are often overgrown with shrubs decreasing landscape visibility and roadside aesthetic quality [1].

TABLE 4
Data about the refurbishment work for road users
[Source: State joint stock company "Latvijas valsts ceļi";
unpublished materials]

Type of work - cutting of bushes in ditches, on slopes and between the road lanes:	Unit	Amount
cutting of bushes with hand tools	ha	98
bush cutting with tractor mounted cutter	km	20 839
bush cutting with mechanical hand held cutter	ha	201
mechanized bush cutting and shredding	ha	7
Grass cutting:		
grass cutting by hand	m ²	284 193
mechanized grass cutting	km	59 763
mechanized grass cutting along the roads with posts	km	15 899
mechanized grass cutting between the road lanes	ha	774
cutting of Siberian hogweed (<i>Heracleum sibiricum</i>)	ha	284
cutting separate <i>Heracleum sibiricum</i> plants	pieces	12
Maintenance of roadside plantings:		
cutting of hedges	m ²	24 635
cutting out branches using hand tools	tree	1 734
removal of individual trees	tree	8 571
removing or chipping stumps	stump	764

Road landscape since 1991 has been influenced by road reconstruction work. Traffic safety measures have played an increasingly important role in road reconstruction since 2000, after the adoption of the First Road Traffic Safety Programme 2000-2006. For example single level road junctions have been changed by adding flyovers and safety barriers are placed along roads with high traffic volumes [9]. Taking into account regulation of spatial planning set by Latvian State Standard [20], means that many small winding roads are straightened for safety reasons and better visibility.

Extensive public discussions take place where old allées are under threat by road reconstruction. Allées are considered to be dangerous by road engineers due to road safety reasons. Society, especially local inhabitants are often against felling old trees. 60 old allées are protected by law [22], but there are many which are not protected. In cases where it is possible to do so, old allées are left on one side of the road, as along the road section between Rīga and Salacgrīva (Fig. 8).

Measures to reduce noise influence road landscapes close to populated areas (Fig. 9). Strategic noise maps for sections of state roads with traffic intensity over 3 million vehicles per year have been developed. Local municipalities are responsible for preparing action plans for noise reduction and more noise barriers may appear in the landscape in future.



Fig. 8. Road Rīga- Salacgrīva, where new lane for one way traffic was built during reconstruction in 80ties and widened during the reconstruction work 2005-2007, moving main traffic away from the allée [Source: photo by author, 2012].



Fig. 9. Sound protection wall, Road Rīga - Salacgrīva [Source: photo by author, 2013].

Future development of the transport system is influenced by various planning documents at different levels and described in the Basic Statements of Transport Development 2014-2020 [10]. Large transport corridors influence landscape structure even at a national scale. Landscape quality is an important tourism resource and its preservation should be supported according to the Sustainable Development Strategy of Latvia 2030 [15].

Conclusions

Road landscape design theory was developed during the Soviet era, but it is not applied in practice at the present time for a variety of reasons, one of which is the limited financial situation of the state. Road design projects from the Soviet era have the potential for further research into road landscape development. Roads have developed over the centuries and the oldest ones should be regarded as part of the cultural heritage.

The road landscape has been influenced by changes in state policy, economics, changes in land ownership and land use type. Aesthetically valuable landscapes and landscapes with high heritage value can be lost due to these changes. It is necessary draw up a system of road landscape evaluation, to assess the current state of existing road plantings and road landscapes at a wider scale, to define the most valuable and at risk road landscapes and to develop action plans for road landscape planning and management at state, regional and local levels.

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INFORMATION ABOUT THE AUTHORS:

Kristīne Vugule, Mg. arch., lecturer at the Faculty of Rural Engineering, department of Architecture and Building of the Latvia University of Agriculture, started doctoral studies in the Latvia University of Agriculture in November 2012. The theme of PhD thesis is “Road landscapes, their values and development scenarios”. E-mail: kristine.vugule@llu.lv

Simon Bell, PhD professor and head of department of landscape architecture at the Estonian University of Life Sciences, Associate Director of the OPEN space Research Centre at University of Edinburgh and visiting professor at the Faculty of Rural Engineering, department of Architecture and Building of the Latvia University of Agriculture since 2012. E-mail: simon.bell@emu.ee

Ilze Stokmane, Dr. oec. in Regional planning, guest lecturer -docent at the Faculty of Rural Engineering, department of Architecture and Building of the Latvia University of Agriculture. E-mail: ilze.stokmane@llu.lv

Kopsavilkums. Pēdējā laikā, pieaugot ceļu izmantošanas intensitātei transporta vajadzībām, cilvēki bieži vēro ceļa ainavu, un daudziem tā kļūst par ikdienas dzīves sastāvdaļu. Ceļu ainava ir attīstījusies ciešā saistībā ar ceļiem un to apsaimniekošanu, kurā atspoguļojas vēstures notikumi, sabiedrības dzīvesveids un prioritātes.

Padomju laikā tika izstrādāta ceļa ainavas projektēšanas teorija, bet mūsdienās ir maz pētījumu šajā jomā un ceļa ainavas attīstībai nepieciešams pievērst lielāku uzmanību.

Ceļa ainavu ietekmē pārmaiņas valsts politikā, ekonomikā, izmaiņas zemes īpašumu struktūrā un izmantošanas veidā. Līdz ar to, mēs varam zaudēt kultūrvēsturiskas un estētiski vērtīgas ainavas. Latvijā ir nepieciešams attīstīt ceļa ainavas novērtēšanas sistēmu, izvērtēt ceļu apstādījumu un ainavas pašreizējo stāvokli, noteikt vērtīgākās un apdraudētās ceļa ainavas un izstrādāt rīcības plānu ceļa ainavas plānošanai un apsaimniekošanai valsts, reģionālajā un vietējā līmenī.

Latvijas ceļa ainavas attīstības izpēte var sniegt jaunus zināšanas un pamatu turpmākai ceļa ainavas attīstības plānošanai. Pētījuma mērķis bija apkopot informāciju par ceļu ainavas un tās pārvaldības attīstību Latvijā līdz 21. gadsimtam. Pētījums tika veikts analizējot un apkopojot informāciju no literatūras avotiem un Latvijas ceļu muzeja materiāliem. Tajā iekļauti foto materiāli no iepriekš veiktas izpētes par ceļa ainavām 2012. un 2013. gadā.