



Latvijas Ģeotelpiskās
informācijas aģentūra

Geospatial heritage digitization project in Latvian Geospatial information agency

Presentation prepared by: Head of the Geospatial Information and Administrative Documents
Archive of the Latvian Geospatial Information Agency Mag iur. Sanita Krūmiņa

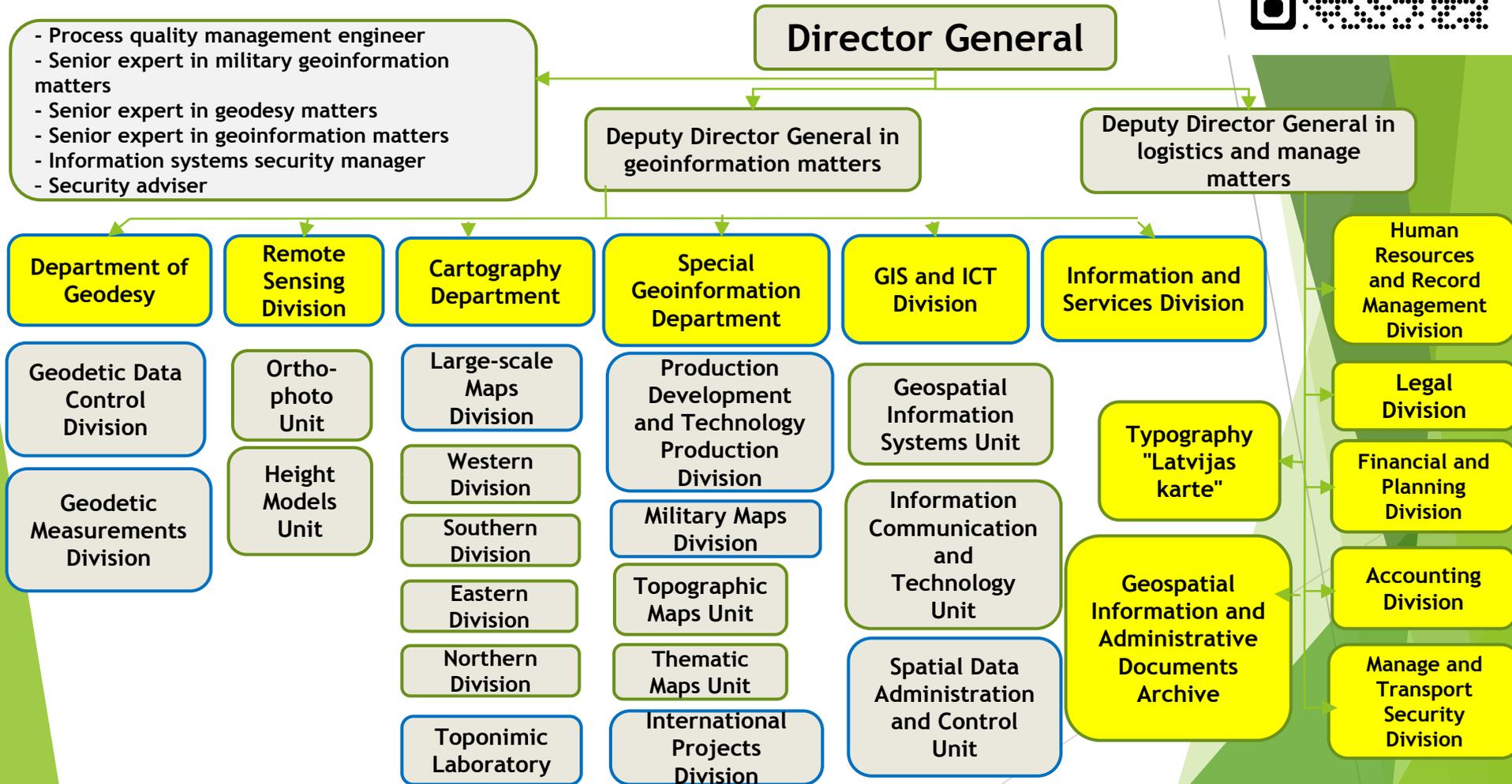
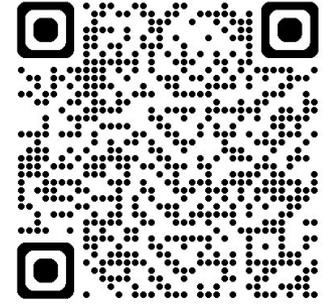
Head of Remote Sensing Division in Latvian Geospatial Information Agency Mg.sc.ing Ivars
Bergmanis

27.05.- 29.05.2024. DLM Forum Members' Meeting in Brussels



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Structure of Agency





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About us

- The Latvian Geospatial Information Agency (hereinafter in the text – LGIA) is the leading institution in the realizing of the national policy in the field of geodesy, cartography and geospatial information.
- The Ministry of Defence plans and monitors the obtaining, preparation and updating of the LGIA geodetic and cartographic basic data, as well as the execution of the geospatial information service providing in accordance with the annual state budget framework.
- Pursuant to the competence the LGIA cooperates with state and local authorities, with the NATO member states, with European Union institutions and competent international organizations, as well as provides to these organizations and to the public geodetic, cartographic and geospatial information.



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Agenda:

- History of archive
- Structure, location of the archive
- Content of the archive collection
- Geodesic fonds
- Cartographic fonds
- Remote Sensing fonds
- Project for the digitization of geospatial material in the archive fonds

Establishment of the LGIA Archive

On 18 October 2005, Cabinet Order No.674 "On Reorganization of the State Land Service" was issued,

Cabinet Order No 821 of 21 December 2005 "On the Establishment of the State Agency "Latvian Geospatial Information Agency"".

The newly established Agency included the Geodesy, Cartography and Large-Scale Mapping Administrations of the State Land Service, the Geodesy and Cartography Departments of 8 regional divisions and the Polygraphy Department "Latvijas karte", the Cadaster Centre Archive and the Cartography Administration Archive, which are the successors to the functions, rights, obligations, property and financial resources of the State Land Service in the field of geodesy and cartography.

The Latvian Geospatial Information Agency Archive started its activity in accordance with Sub-paragraph 4.6 of the Cabinet Regulation No 987 of 20 December 2005 "Statute of the State Agency "Latvian Geospatial Information Agency"" - "to establish and maintain an archive of geodetic and cartographic materials".

LGIA ARCHIVE OF GEOSPATIAL INFORMATION AND ADMINISTRATIVE DOCUMENTS

The geospatial information fond material is provided with a permanent storage function, as the material is not transferred to the Latvian National Archives

As of 2023 keep 420 000 mat./units

GEOSPATIAL INFORMATION FONDS

Geodesy fonds

Cartography
fonds

Remote sensing
material fonds

Cross-sectoral fonds

Historical geospatial material fonds

Paper format

Hybrid format

Electronic
format

ADMINISTRATIVE DOCUMENTS FONDS

Paper format

Hybrid format

Electronic format



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CONTENT OF THE LGIA GEOSPATIAL INFORMATION FUNDS

Geodesy fonds

National geodetic network, catalogues - triangulation, levelling, GPS, polygon-metry, magnetometry, etc.

Cartography fonds

Civil maps, military maps, national borders, US military map materials, Baltic Sea, Latvian lakes, etc.

Remote sensing material fonds

Cycle 1 to 7 aerial photography materials, 1 cycle aerolaser scanning materials, etc

Cross-sectoral fonds

ERDF project material in all geospatial sectors

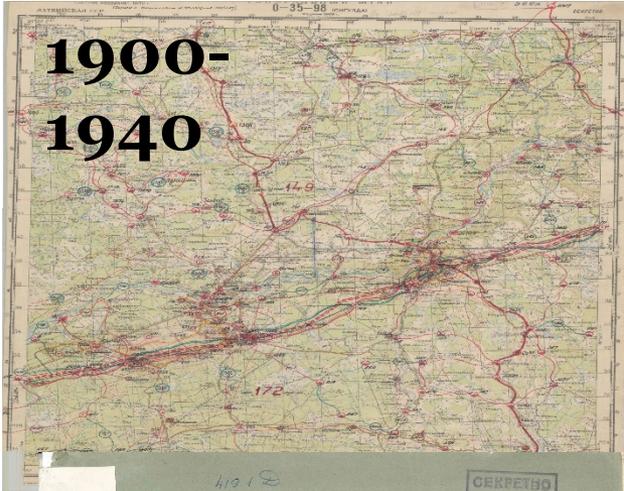
Historical geospatial material fonds

Geospatial material from all disciplines for the period from:

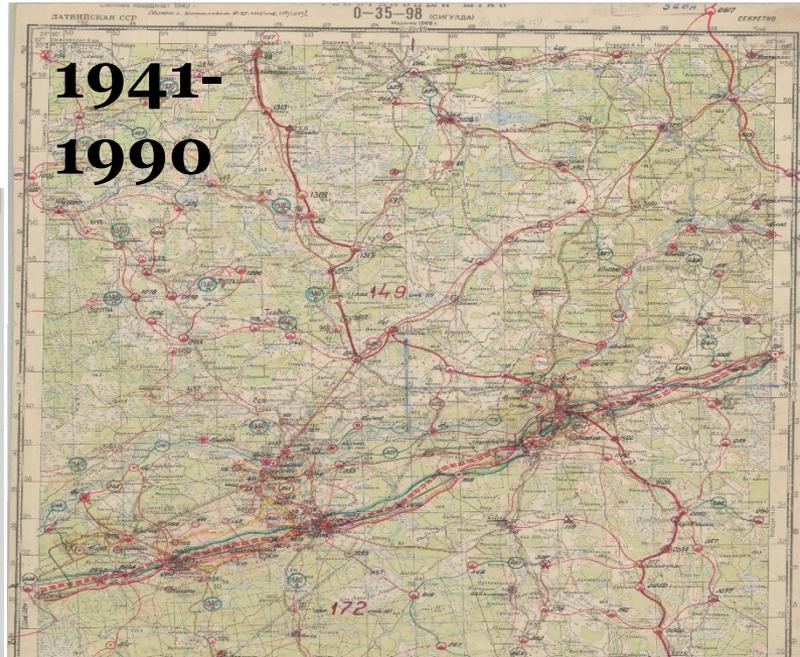
- ✓ 1900-1945,
- ✓ 1946-1990,
- ✓ from 1991 to the present.;

Geodesy fonds

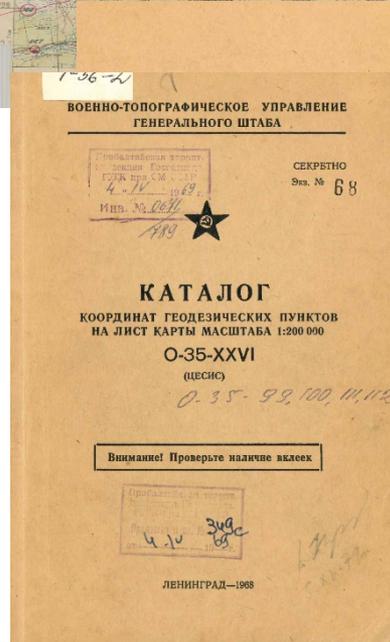
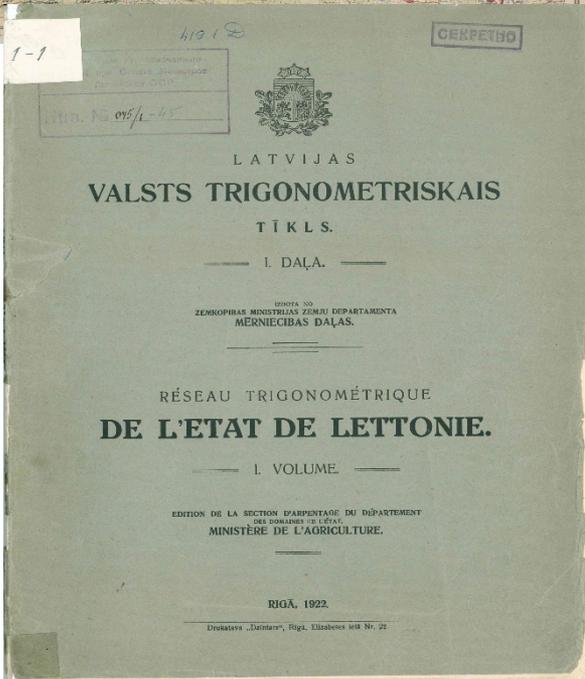
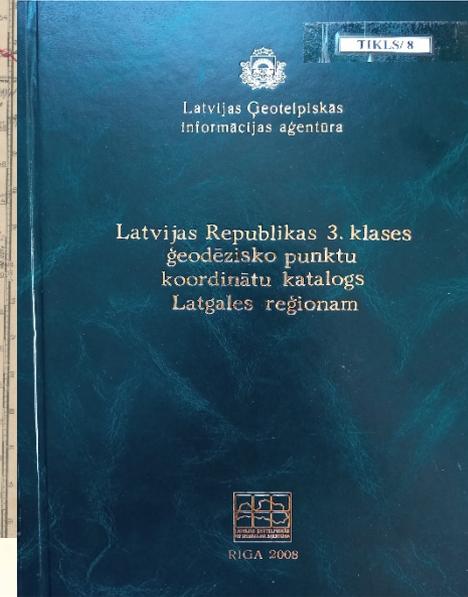
1900-
1940



1941-
1990

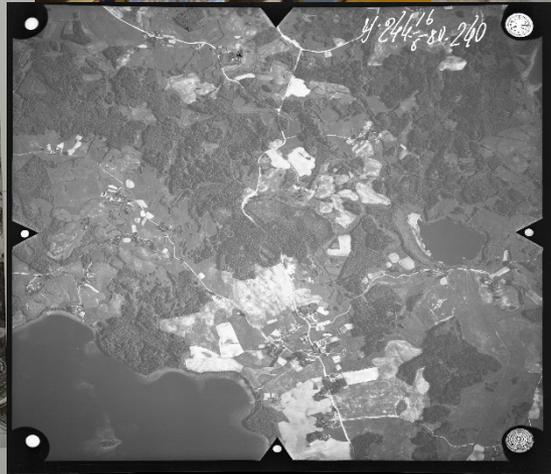


1991-



Remote sensing material fonds

The LGIA archive contains ~200 000 historical aerial images from 1954-1989, undeciphered USSR-era photographic layers on aluminum plates



Западный филиал „ВИСХАГИ“

Идентификационный номер: Н-696

Классификация: 99, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200

1983 Заказчик

20000 Тип, №АФА и его i

Размер аэронегативов 18x18

№№ 692-732, 749-1011

314 штук

Серия №

3

№ / 1001 100A

In 2019 the project "DIGITALIZATION OF THE GEOTELPIC HERITAGE OF LGIA" was launched

PROJECTS OBJECTIVE

1. To make a long-term contribution to the development of geo-information and add value to the cultural environment by ensuring the systematic and sustainable digitization of geo-information.
2. To improve the processes of digitization, preservation and distribution of geo-information heritage.

Projekta plānojums laika periodā no 2023.-2030.gadiem.

N.p.k.	Geotelpiskā materiāla nosaukums	2023.				2024.				2025.				2026.				2027.				2028.				2029.				2030.			
		I.c.	II.c.	III.c.	IV.c.																												
1.	63.gada k.s. kartogrāfiskais materiāls M1:10 000	pl.																															
		p/d																															
		d	d	d	d	d																											
		p/a	p/a	p/a	p/a	p/a	p/a	p/a	p/a																								
2.	Katalogi-trigonometriskais tīkls (franču)-1940	pl.																															
		p/d																															
		d	d	d	d	d																											
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3.	Vertikālās uzmērīšanas lietas					pl.	pl.																										
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4.	Rajonu robežas, Latgīprozem (Katalogs+shēmas)									pl.	pl.																						
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5.	Geodēzisko punktu koordinātu karalogi ar shēmām M1:200 000 C-sistēma Leningrada									pl.	pl.																						
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6.	Geodēzisko punktu koordinātu katalogi ar shēmām M1:200 000 C-sistēma Minska													pl.	pl.																		
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7.	Pilsētu plāni un plāni-shēmas (dažādi mērogi)													pl.	pl.																		
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8.	Rīgas pilsēta-geodēziskie katalogi, karšu materiāls																	pl.	pl.														
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9.	5.fabrikas kartogrāfiskie materiāli																	pl.	pl.														
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10.	Eiropas kartogrāfiskais materiāls-Polijas, Dienvidslāvija un citu valstu kartes																					pl.	pl.										
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11.	Formulāri M1:2 000, M1:5 000, pilsētas: (1., 2.izdevums)																					pl.	pl.										
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		p/a	p/a	p/a	p/a	p/a	p/a	p/a	p/a																								
12.	Image city graphic																									pl.	pl.						
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		p/a	p/a	p/a	p/a	p/a	p/a	p/a	p/a																								
13.	Amerikāņu kartes M1:50 000, 1. izdevums																													pl.	pl.		
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		p/a	p/a	p/a	p/a	p/a	p/a	p/a	p/a																								
14.	Skenētās ainas M1:30 000	pl.	pl.																														
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		p/a	p/a																														
15.	Orto-foto materiāli-uzlidojumi (negatīvi)																	pl.	pl.														
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		d	d																														
		p/a	p/a																														

plānošana pl.
pirms digitalizācijas p/d
digitalizācija d
pēcdigitalizācijas apstrāde p/a
* Projekta plānojumā riski nav ietverti

1922-1940

СЕРПЕТНО



LATVIJAS VALSTS TRIGONOMETRISKAIS TIKLS.

I. DAĻA.

IZDOTA NO ZEMKOPĪBAS MINISTRIJAS ZEMĒJ DEPARTAMENTA MERNĪCĪBAS DAĻAS.

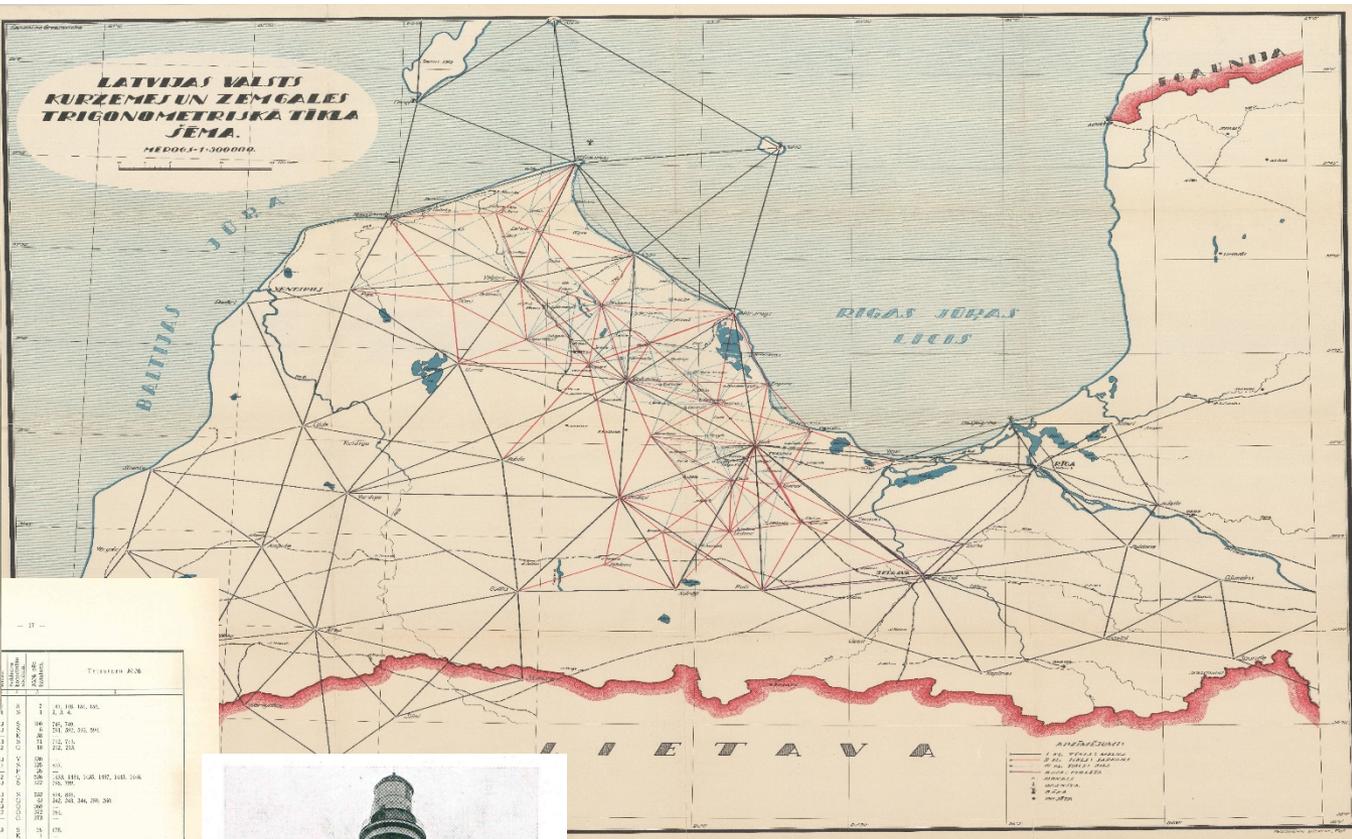
RÉSEAU TRIGONOMÉTRIQUE DE L'ÉTAT DE LETTONIE.

I. VOLUME.

ÉDITION DE LA SECTION D'ARPENTAGE DU DÉPARTEMENT DES DOMAINES ET L'ÉLEVÉ MINISTÈRE DE L'AGRICULTURE.

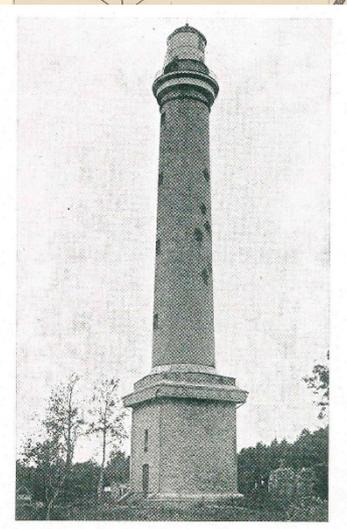
RĪGĀ, 1922.

Drukātavas "Latvian", Rīga, Eļķinieku ielā Nr. 22



№	Latvian Name	Lat	Long	Height	Notes
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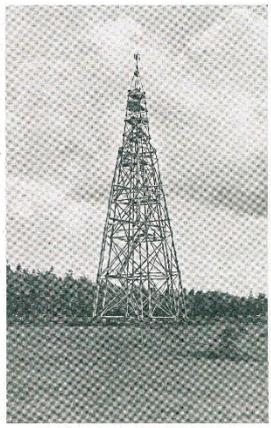
№	Latvian Name	Lat	Long	Height	Notes
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№ 10. 1. klases trigonometriskais punkts „Mikheľbaka”. Der „trigonometrische Punkt I Ordnung „Mikheľbaka”. Тригонометрический пункт I-го класса — „Mikheľbaka” (Михаиловский маяк).



№ 3. Jēlgavas bēzes mērijuma. Mesuring der Grundlinie bei Jēlgava. Измерение Митавского базиса.



№ 4. Jēlgavas bēzes signāls „Dab'e” — uz betona pamatniem. Бетонный Сигналы: J. Vitols II. Das Signal „Dab'e” der Mitauschen Grundlinie auf Betonfundamenten. Bauleiter: J. Vitols II. Сигналы „Dab'e” — Митавского базиса — построены на бетонных основаниях, возведенных для этой цели. Строитель — J. Vitols 2-ой.

6. The catalogue contains materials with different content or quality and they require different resolutions for digitization

Solutions:

1. In order to carry out the technical digitization of the material, it was necessary to test different digitization methods on one catalogue, to evaluate the dpi resolution parameters, and to assess the binding characteristics,
2. The systematization of the material after digitization required cooperation with IT specialists in the search for solutions - conversion of Cyrillic to Latin alphabet and preparation of metadata
3. The material had to be traced back to the time of its production - 1954

Result of digitisation :

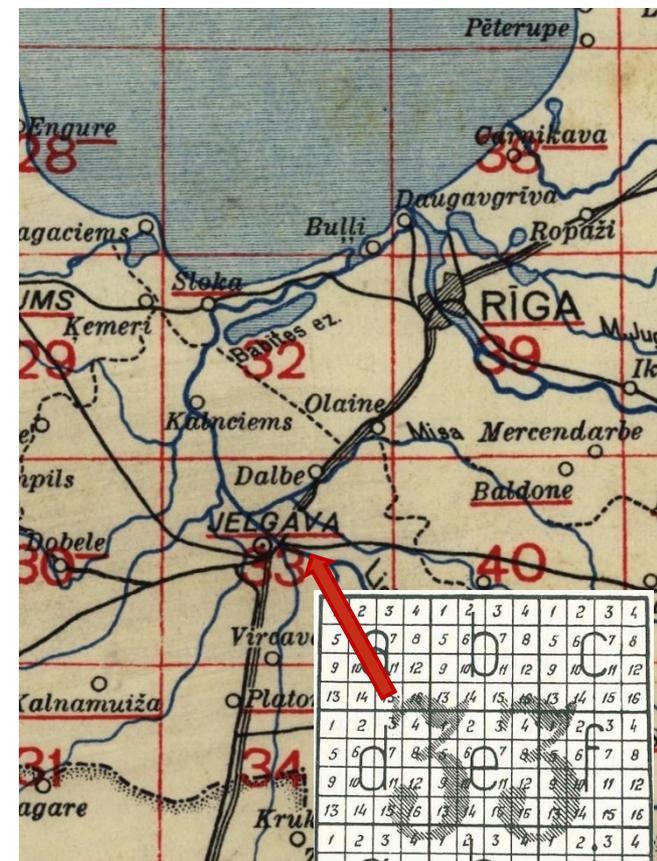
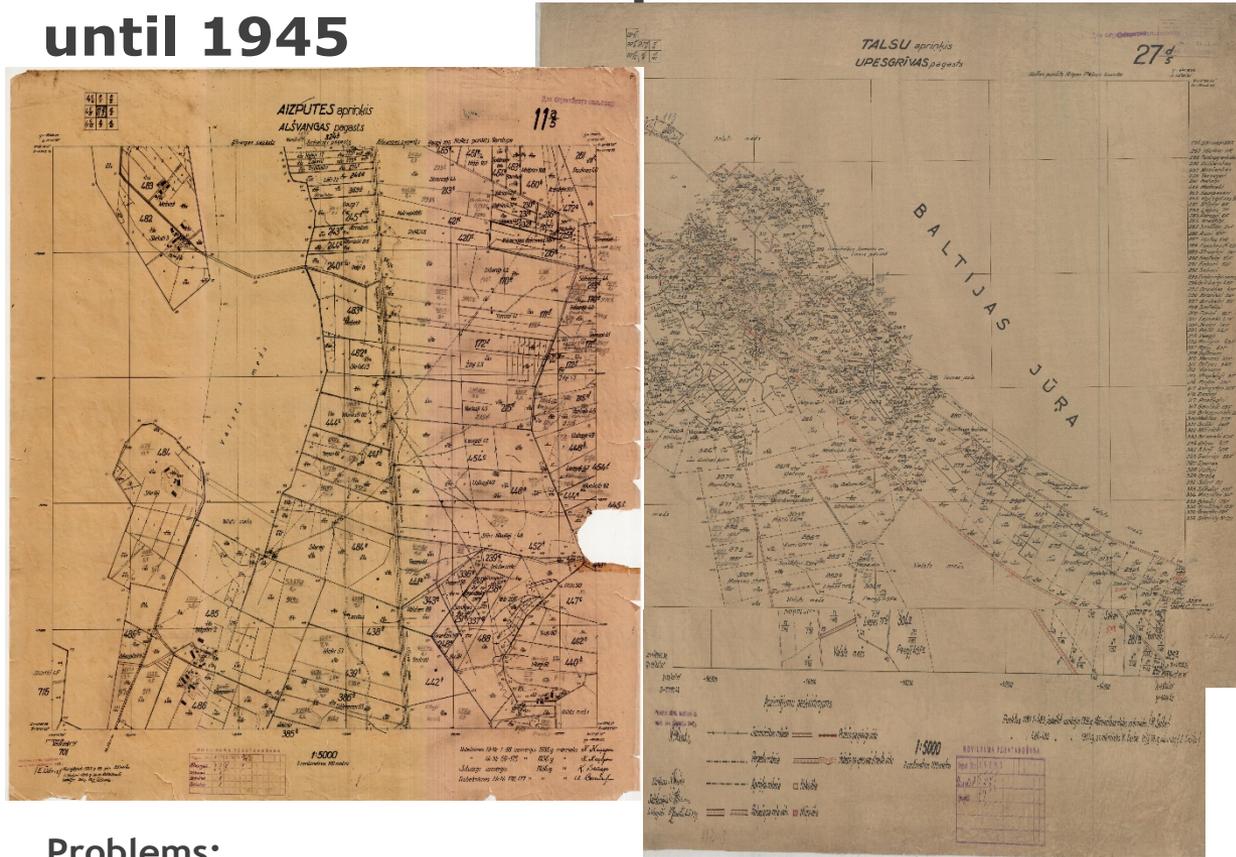
1. More than 5 000 map pages scanned,
2. 200 schemes scanned,
3. Electronic register produced,
4. Description of material prepared



Conclusions:

1. Before starting digitization, identify risks, plan ranges of resolution, systematization, file name formats, post-processing and preservation methods,
2. Test possible methods and solutions by carrying out tests on the material to be digitized before digitization,
3. Pay close attention throughout the digitization process to changes in the physical and content format of any type of material.

Cadastral maps of the Republic of Latvia until 1945



Problems:

- 1) In order to start working on such old material (1920-1940), it was necessary to make a reference - on the basis of which normative regulation the preparation of this geospatial material was carried out,
- 2) The level of development of the material and the quality of the information contained in it varied greatly,
- 3) The administrative territorial division of the districts and settlements of the Republic of Latvia in the period 1920-1940 does not correspond to the administrative territorial division of the present time,
- 4) The material has two scales - M 1:2 500, M 1:5 000, it was necessary to convert the scales from M 1:300 000 to M1:75 000, from M 1:75 000 to M 1:5 000,
- 5) The technical quality of the material was very poor,
- 6) Non-standard format;

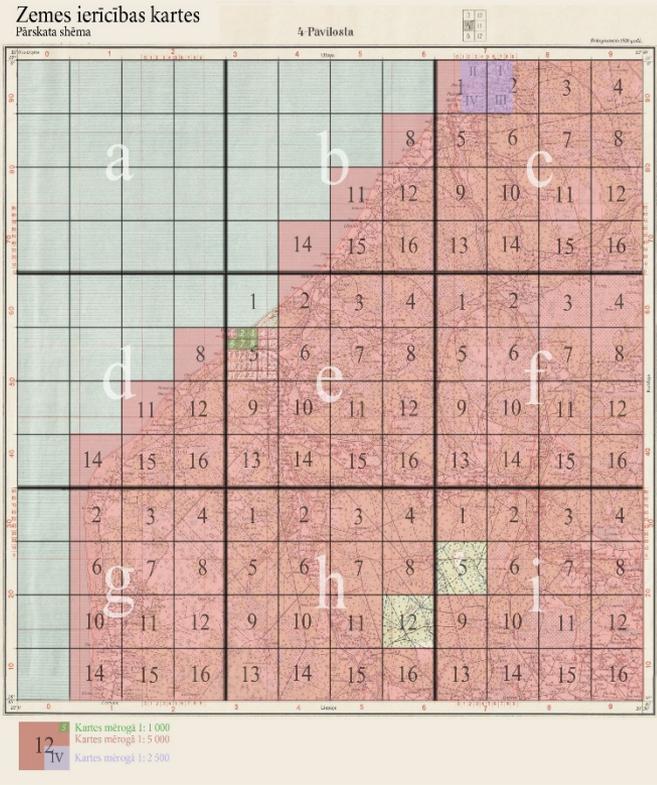
LR cadastral history sources



Solutions:

- 1) A regulatory framework was found on the basis of which the digitization, processing and preservation of geospatial material was carried out,
- 2) Map material was found for the relevant years at specific scales for accurate scale conversion and technical cartogramming,
- 3) The material was cleaned of dirt, tape and glue paper,
- 4) In order to damage the material as little as possible, it was digitized using the double-sided film method (The double-sided film method is a method in which each trapezoid is individually placed in a film and digitized),
- 5) The image digitisation, processing and preservation methods were carried out using the NEXT IMAGE image processing software for each trapezoid separately, assessing its technical quality.

Pāvilosta 4											
a/1	a/2	a/3	a/4	b/1	b/2	b/3	b/4	c/1	c/2	c/3	c/4
a/5	a/6	a/7	a/8	b/5	b/6	b/7	b/8	c/5	c/6	c/7	c/8
a/9	a/10	a/11	a/12	b/9	b/10	b/11	b/12	c/9	c/10	c/11	c/12
a/13	a/14	a/15	a/16	b/13	b/14	b/15	b/16	c/13	c/14	c/15	c/16
d/1	d/2	d/3	d/4	e/1	e/2	e/3	e/4	f/1	f/2	f/3	f/4
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d/13	d/14	d/15	d/16	e/13	e/14	e/15	e/16	f/13	f/14	f/15	f/16
g/1	g/2	g/3	g/4	h/1	h/2	h/3	h/4	i/1	i/2	i/3	i/4
g/5	g/6	g/7	g/8	h/5	h/6	h/7	h/8	i/5	i/6	i/7	i/8
g/9	g/10	g/11	g/12	h/9	h/10	h/11	h/12	i/9	i/10	i/11	i/12
g/13	g/14	g/15	g/16	h/13	h/14	h/15	h/16	i/13	i/14	i/15	i/16



Pāvilsta 004	Aizputes apriņķis	Ulmales pagasts	Baltijas jūra	4	b	8	1:5 000
	Aizputes apriņķis	Ulmales pagasts	Baltijas jūra	4	b	11	1:5 000
	Aizputes apriņķis	Ulmales pagasts	Baltijas jūra	4	b	12	1:5 000
	Aizputes apriņķis	Ulmales pagasts	Baltijas jūra	4	b	14	1:5 000
	Aizputes apriņķis	Ulmales pagasts	Baltijas jūra	4	b	15	1:5 000
	Aizputes apriņķis	Ulmales pagasts	Baltijas jūra	4	b	16	1:5 000
	Aizputes apriņķis	Ulmales un Jūrkalnes pagasts	Baltijas jūra	4	c	1	1:5 000
	Aizputes apriņķis	Jūrkalnes pagasts	Baltijas jūra	4	c	1-II	1:2 500
	Aizputes apriņķis	Jūrkalnes pagasts	Baltijas jūra	4	c	1-IV	1:2 500
	Aizputes apriņķis	Jūrkalnes pagasts	Baltijas jūra	4	c	2	1:5 000
	Aizputes apriņķis	Jūrkalnes pagasts	Baltijas jūra	4	c	2-I	1:2 500
	Aizputes apriņķis	Jūrkalnes pagasts	Baltijas jūra	4	c	2-III	1:2 500
	Aizputes apriņķis	Jūrkalnes pagasts	Baltijas jūra	4	c	3	1:5 000

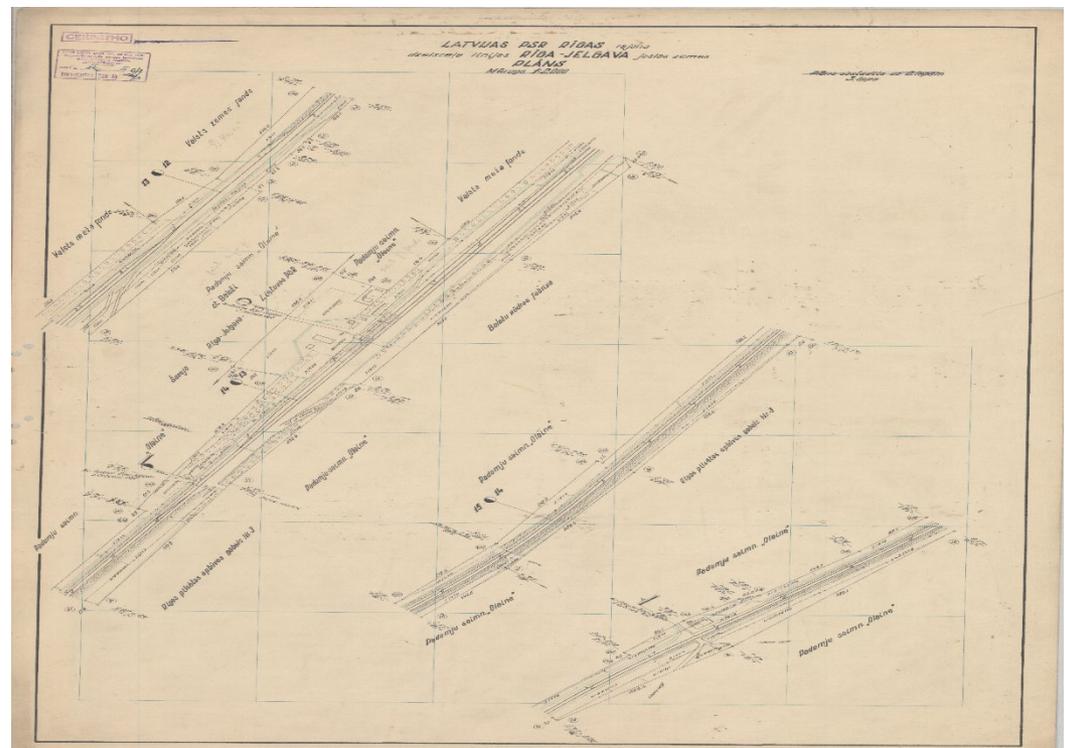
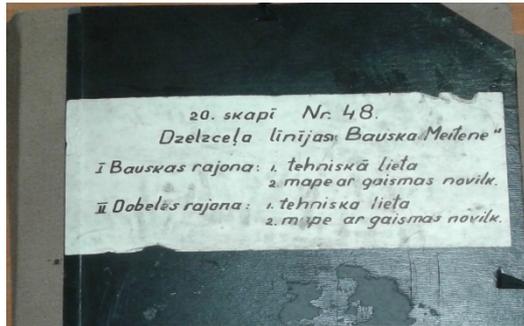
Result of digitisation:

- 1.4341 matrices scanned,
2. Technical cartogram prepared,
3. Prepared 1:2 500 and 5 000 map overlays in 1:75 000 for the whole territory of Latvia,
4. Electronic inventory register prepared,
5. Prepared material description

Conclusions:

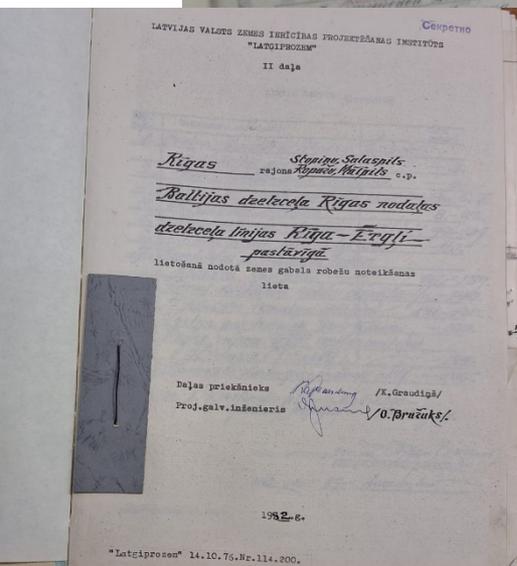
1. In order to systematize the material, it is necessary to coordinate the systematization and preservation methods with IT specialists before digitization begins,
2. Test possible methods and solutions for handling and processing the material by conducting tests before starting the digitization process,
3. Be aware of the risks and pay close attention throughout the digitization process to any changes in the physical state of the material.

Latvian railway lines - until 1990



Problems:

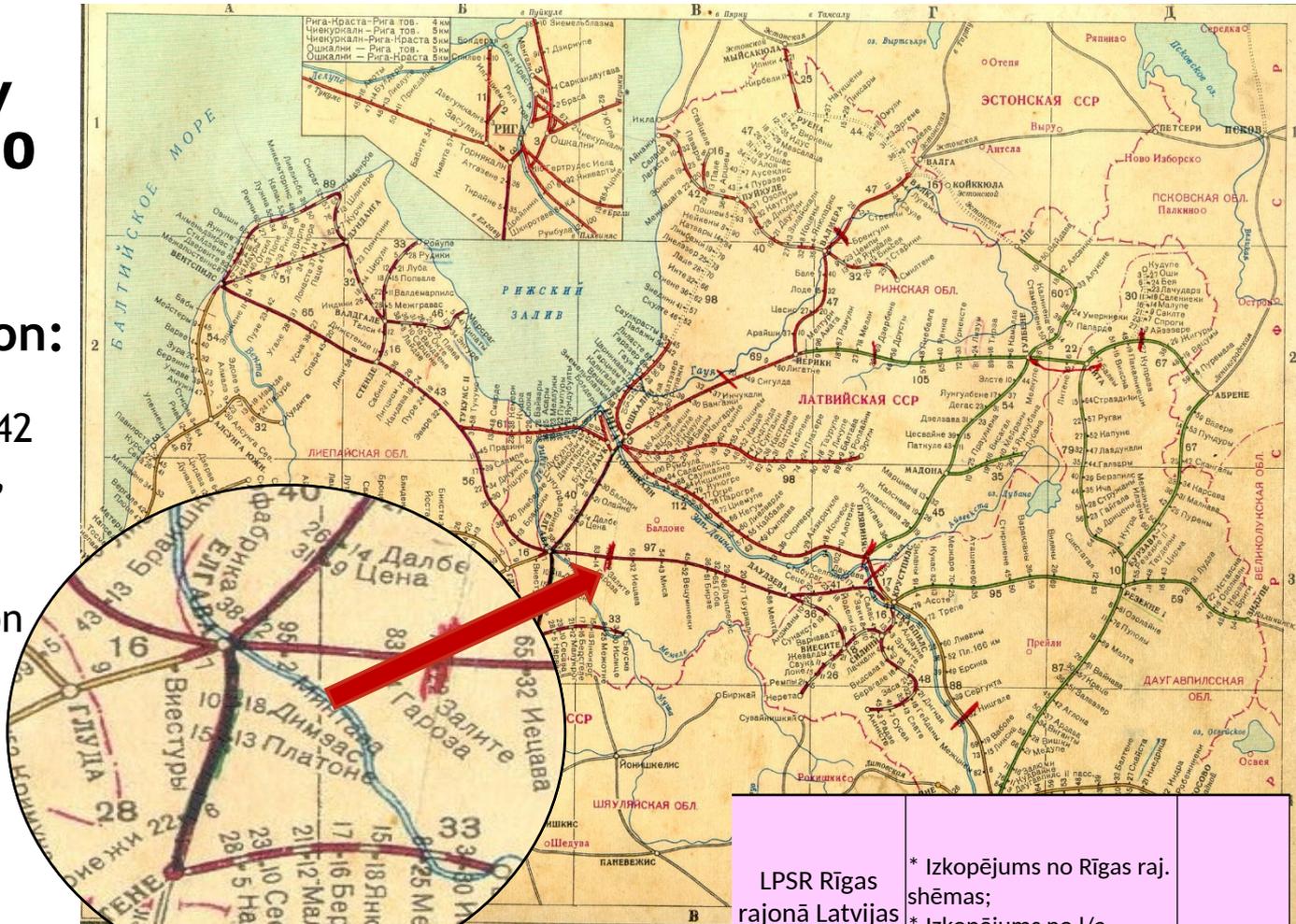
- 1) The material did not have a description, a reference had to be made,
- 2) The level of development of the material and the quality of the information contained in it varied widely,
- 3) The material had schemes and catalogues - different type of media,
- 4) It was necessary to renovate the files in order to digitize the material,
- 5) Non-standard formats,
- 6) The medium was very thick paper,
- 7) Technical files partly in handwriting.



Latvian railway lines - until 1990

Result of digitization:

- 1.Scanned 578 schemes - 42 railway lines in A0 format,
- 2.Prepared an electronic record book,
- 3.Technical file description prepared for each line separately,
- 4.Renovation of files.



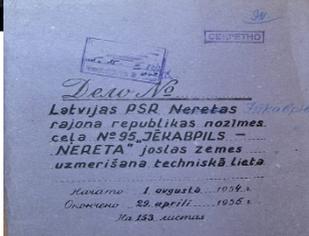
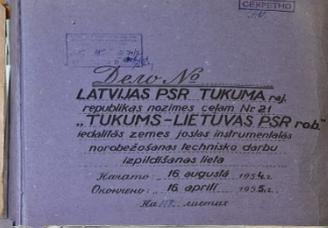
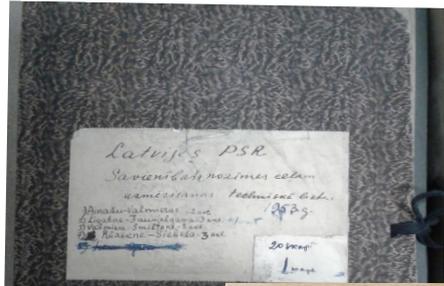
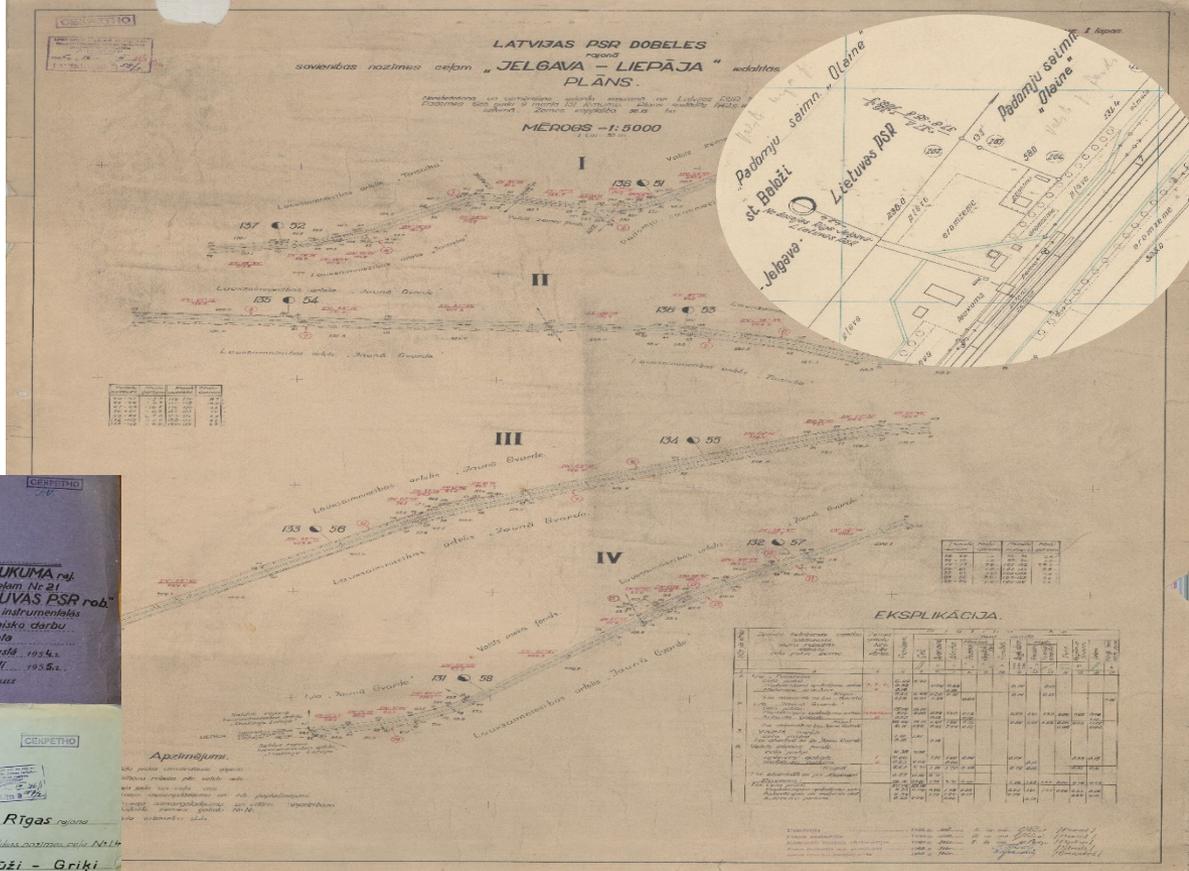
LPSR Rīgas rajonā Latvijas dzelzceļa pārvaldes dzelzceļa līnijas "Maskava-Rīga" joslas zemes robežu uzņēmēšanas tehniskā lieta

* Izkopējums no Rīgas raj. shēmas;
 * Izkopējums no I/a "Jaunā staume" plāna;
 * Piesaiates punktu koordin. izraksts no dzelzc. plāna;
 * Mērīšanas žurnāls ar abrisiem;
 * Koordinātu aprēķini;
 * Papildu koord. aprēķini;
 * Tiešo un pretējo ģeodēzisko uzdevumu aprēķini; "

maijā 1958.g.-decembrī 1961.g.

N.p.k.	Tehniskās lietas mapes Nr.	Linija	Rajons	Staciju nosaukumi līnijās	Lapas #	Mērogs	Materiāla invent.gads	Piezīmes	Komentāri
1	30	Maskava-Rīga	Rīgas rajons	Rīgas pilsēta	1	M 1:2 000	1965.	Pilns sastādīts pēc 1958.g. un 1959.g. uzņēmēšanas materiāliem	Latvijas dzelzceļa pārvaldes dzelzceļa "Rīga-Indra"- "Maskava-Rīga" rajona atsavinātās joslas zemes plāns
inv. Nr 1/3-9		Maskava-Rīga	Rīgas rajons	st. Rumbula	2	M 1:2 000	1965.		
		Maskava-Rīga	Rīgas rajons	st. Dārziņi	3	M 1:2 000	1965.		
		Maskava-Rīga	Rīgas rajons		4	M 1:2 000	1965.		
		Maskava-Rīga	Rīgas rajons		5	M 1:2 000	1965.		
		Maskava-Rīga	Rīgas rajons	st. Saulkalne	6	M 1:2 000	1965.		

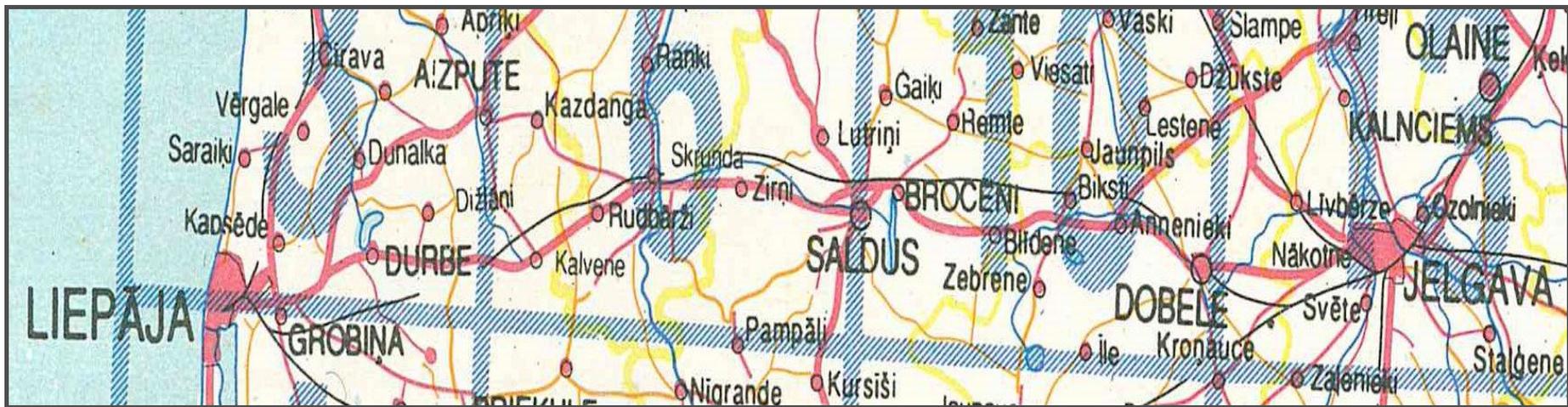
Latvian road lines - until 1990



Problems:

- 1) The material did not have a description, a reference had to be made,
- 2) The level of development of the material and the quality of the information contained in it varied widely,
- 3) The material had schemes and catalogues - different media,
- 4) It was necessary to renovate the files in order to digitize the material,
- 5) Non-standard formats,
- 6) The medium was very thick paper,
- 7) Technical files partly in handwriting.

Lietas saturs			
Nr./p.k.	Dokumenta nosaukumi	Lapu Nr./Nr.	Pēcīmes.
1.	Izkopijums no Balstakļu plāns un asijņu savstarpējās plānām - Cēsu novads	1.	
2.	Darņāsts, no Cēsu novada Raikis, artilē (rošā) iemēģinātas zemes, līnijas bus koordinācijām. Cēstas	2.-4.	
3.	Mērīšanas darņāsts	5.-34.	
4.	Līniju nosaukuma sēma	35.	
5.	Šķēršņu gabulu platības aprēķināms (194a)	36.	
6.	Koordinātu aprēķināms	37.-46.	
7.	Platības aprēķināms	47.	
	1954.g. 1. aprīlī 2. 24. mē. zemes iemēģināms: M. M. M.		
8.	Mērīšanas darņāsts - nodalās priekšmēģināms par darbiem pārbaudi daļā	48.-54.	
9.	Balstakļu aprēķināms pārbaudes kapa	50.	
10.	Šķēršņu darbi karņāmats pārbaudi m. 1954g. 2. aprīlī	51.	
11.	2. aprīlī 1954g. 13. aprīlī 2. 24. mē. zemes iemēģināms: M. M. M.	52-57.	



Ceļa līnijas Nr.	Invent.Nr.	Līnija	Rajons	Ģeogrāfiskie nosaukumi	Digitalizētās lapas Nr.	Mērogs	Materiāla izstrādes gads	Piezīmes	Komentāri
40	inv.Nr. 1/6-8, 12-22, 24-26	Rīga - Daugavpils - Smolenska	Rīgas rajons	*	1	M 1: 5000	1958.	Zemes kopplatība - 78,82 ha	Latvijas PSR Rīgas rajonā Savienības nozīmes ceļam "Rīga-Daugavpils" iedalītās zemes joslas plāns
40		Rīga - Daugavpils - Smolenska	Rīgas rajons	*	2	M 1: 5000	1958.		
40		Rīga - Daugavpils - Smolenska	Rīgas rajons	Eksplikācija	3	M 1: 5000	1958.		
40		Rīga - Daugavpils - Smolenska	Ogres rajons	*	4	M 1: 5000	1958.	Zemes kopplatība - 241,09 ha	Latvijas PSR Ogres rajonā Savienības nozīmes ceļam "Rīga-Daugavpils" iedalītās zemes joslas plāns
40		Rīga - Daugavpils - Smolenska	Ogres rajons	*	5	M 1: 5000	1958.		*
40		Rīga - Daugavpils - Smolenska	Ogres rajons	Cietuupe	6	M 1: 5000	1959.		*
40		Rīga - Daugavpils - Smolenska	Ogres rajons	*	7	M 1: 5000	1959.		*
40		Rīga - Daugavpils - Smolenska	Ogres rajons	Kaibalas upe	8	M 1: 5000	1958.		*
40		Rīga - Daugavpils - Smolenska	Ogres rajons	*	9	M 1: 5000	1958.		*

Conclusions:

Digitization:

- 1.411 schemes for 61 road lines in A0 format scanned,
2. An electronic record book was produced,
3. Technical file descriptions for each line separately,
4. Renovation of the files;

1. In order to systematize the material, it is necessary to coordinate the methods of systematization and preservation with IT specialists before starting digitization,
2. Test possible methods and solutions for handling and processing the material by conducting tests before starting the digitization process,
3. Be aware of the risks and pay close attention throughout the digitization process to any changes in the physical state of the material.

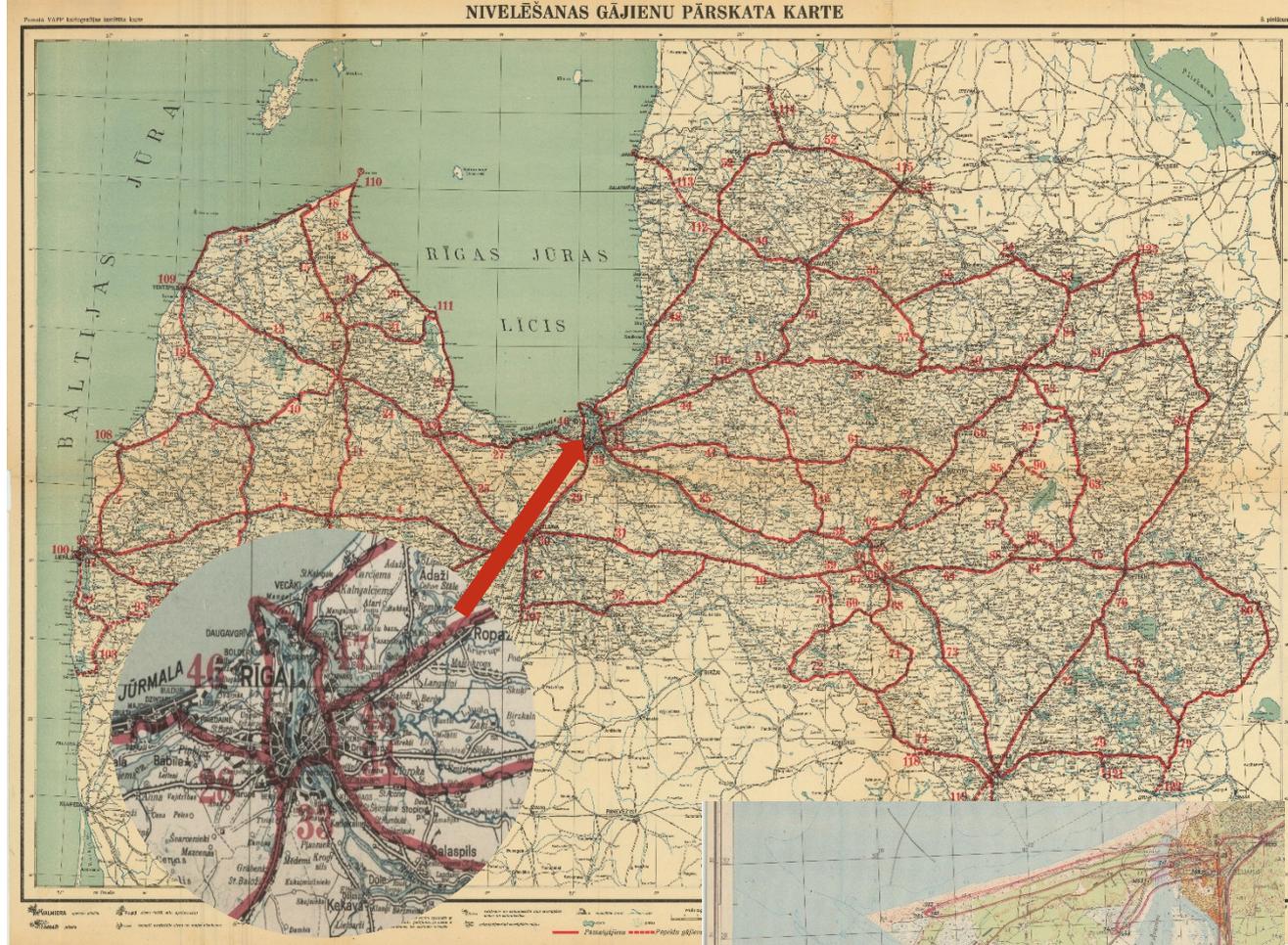
Latvian SSR levelling tracks - 1990

Digitization:

1. All levelling tracks of the Latvian SSR in the O system M 1:100 000, M 1:50 000 and M 1:25 000 have been scanned,
2. electronic records have been prepared,
3. A description of the material;

Conclusions:

1. In order to systematize the material, it is necessary to coordinate the methods of systematization and preservation with IT specialists before starting digitization,
2. Test possible methods and solutions for handling and processing the material by carrying out tests before starting the digitization process,
3. Be aware of the risks and pay close attention throughout the digitization process to any changes in the physical state of the material.

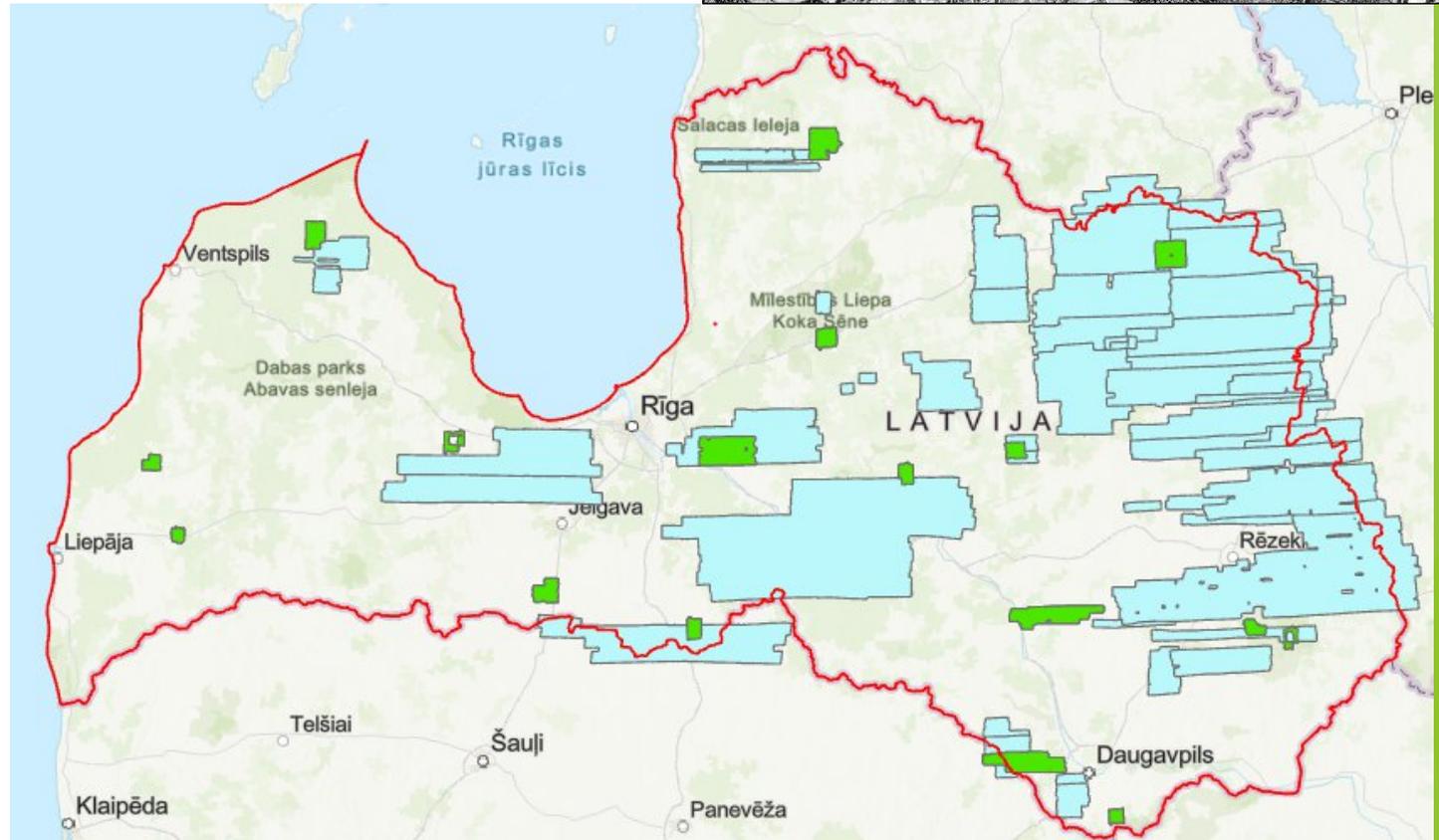
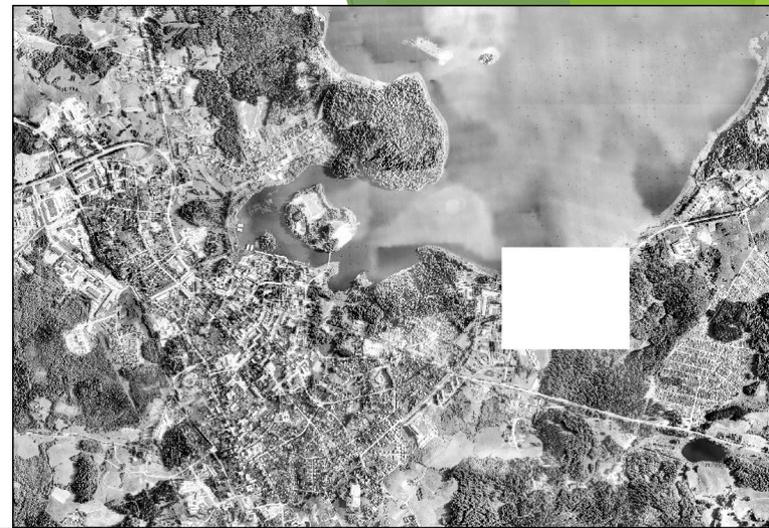


Remote sensing - up to 1990

LGIA archive

~200 000 images from
the year 1954

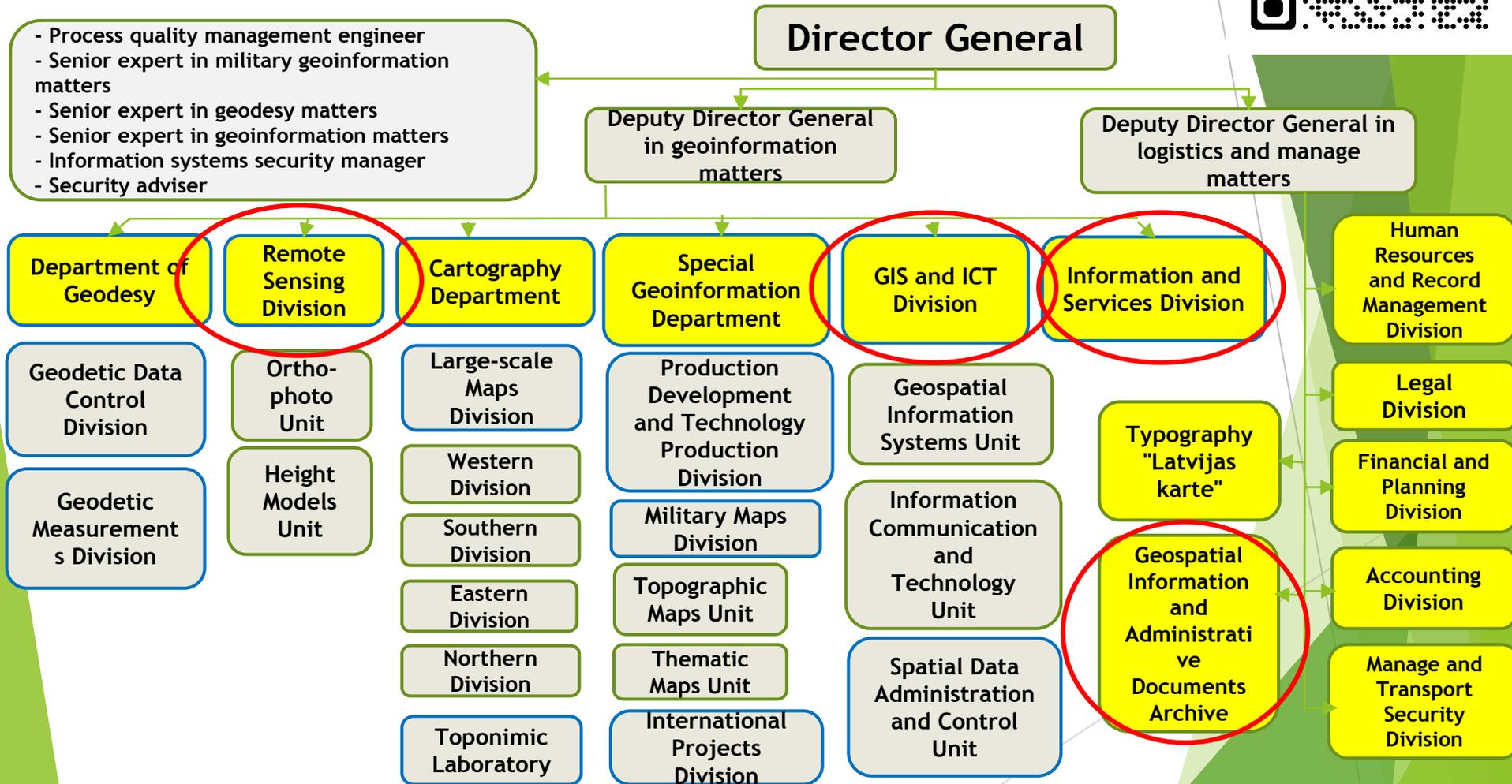
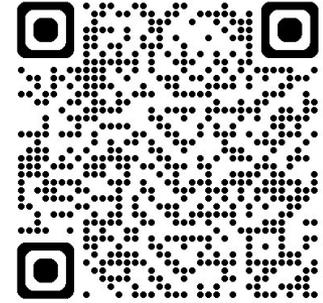
~ 16 5000 scanned images, from period 1965
– 1989





Latvijas Ģeotelpiskās informācijas aģentūra

Cooperation



Before the digitization process coordinate with IT specialists:

- 4 File structure and file naming,
- 4 Capture tools,
- 4 Processing tools,
- 4 Quality Control,
- 4 Search and retrieval tools,
- 4 Long-term storage conditions;

The digitization process includes:

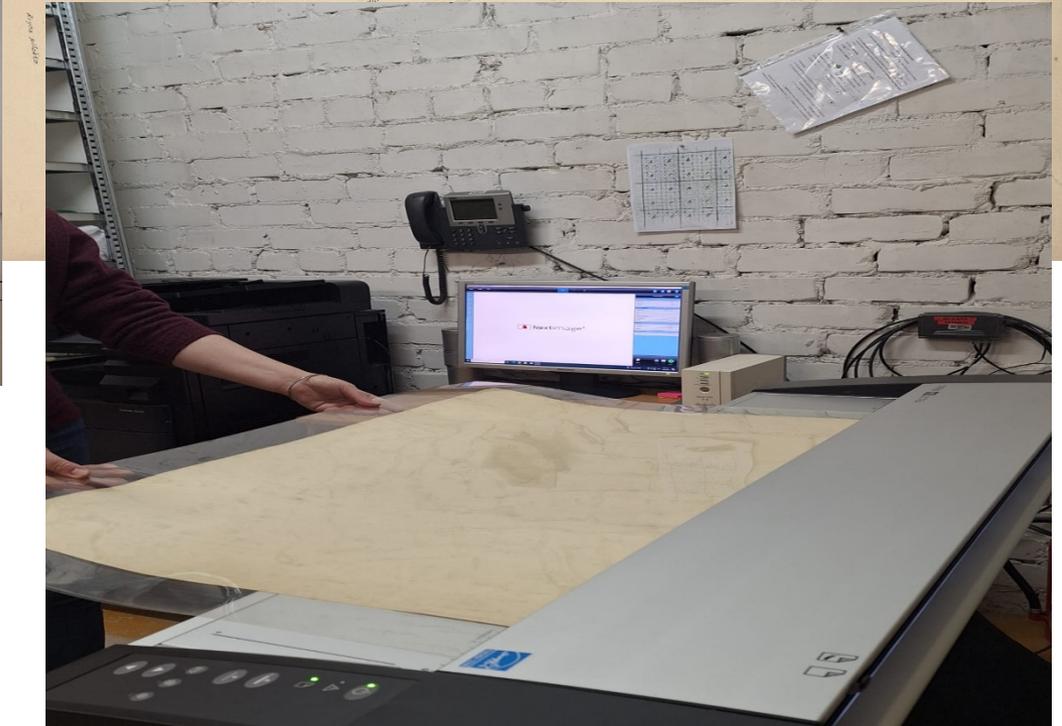
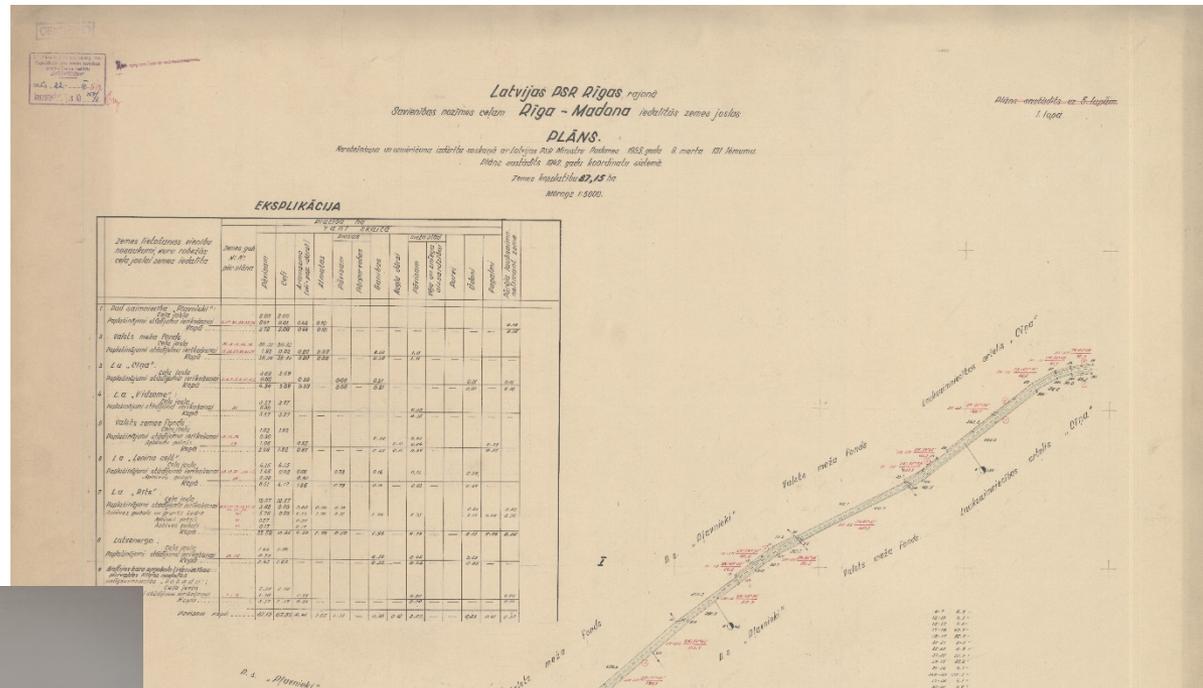
- 4 Preparing the description,
- 4 Technical digitization of materials,
- 4 Preparation of an inventory register,
- 4 Preparation of cartogram,
- 4 Description of technical reports, according to the project,
- 4 Application of schematics to geospatial material;

It was important to provide tools for the mutual integrity and future use of all geospatial materials, both between geospatial domains and between geospatial materials within a domain.

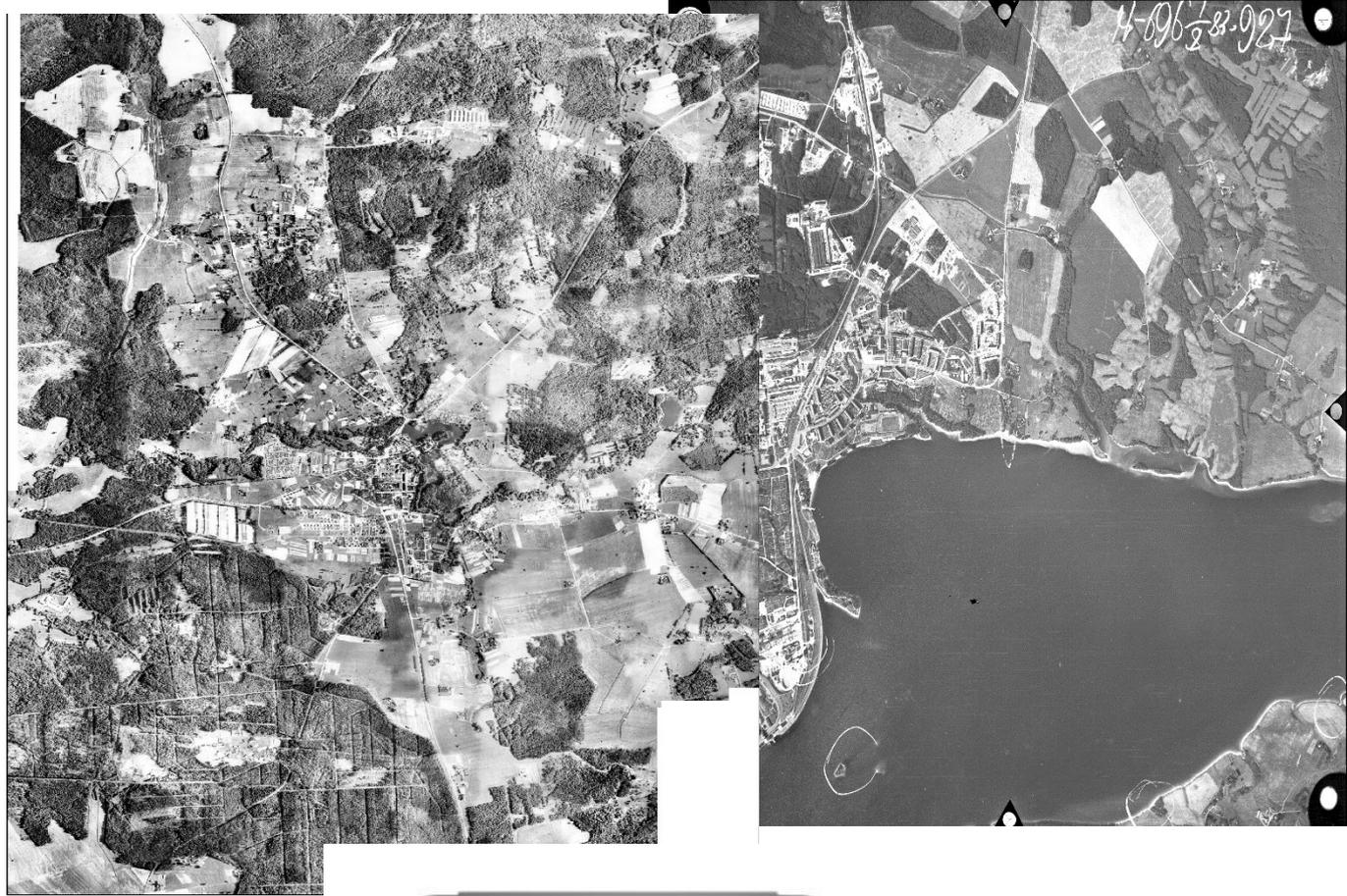
Project risks:

- 4 The solutions included in the project are identified at a general level of digitization and may be modified during the execution of the work as required and unforeseen situations arise,
- 4 The implementation of the project is carried out with IT specialists joining at the level of consultancy and technical support,
- 4 Lack of advanced archive specialists - as the project requires archive specialists with both basic geospatial knowledge and IT knowledge of the technical solutions for the material to be digitized.

Scanning equipment for large-format and non-standard-format materials



**Technology
used to
scan
remote
sensing
material**



**Epson Expression 12000XL
Photo Scanner**
Epson PERFECTION V850 PRO



Latvijas Ģeotelpiskās
informācijas aģentūra

Thank you for attention!

Questions?

