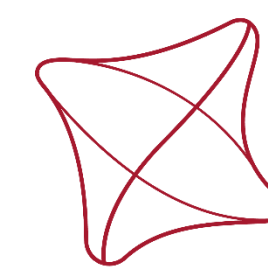


# PROCEDURE FOR DESIGNING THE IMPLEMENTATION OF AUTOMATED LOGISTICS



UNIVERSITY OF ŽILINA  
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## 1. INITIAL PHASE OF THE PROJECT

- Problem definition.
- Making strategy to the future.
- Creating a research team.
- Set phases and deadlines.

## 2. SYSTEM ANALYSIS

- Analysis of material flow.
- Data collecting.
- Information verifying.
- Data processing and transforming to the structured database PFEP.

## 3. PROCESS ANALYSIS

- The principle of the organizational structure of logistics
- Identify and verify the characteristics of the main transport relationships within the plant
- List of transport used equipment
- Analysis of production areas related to the project

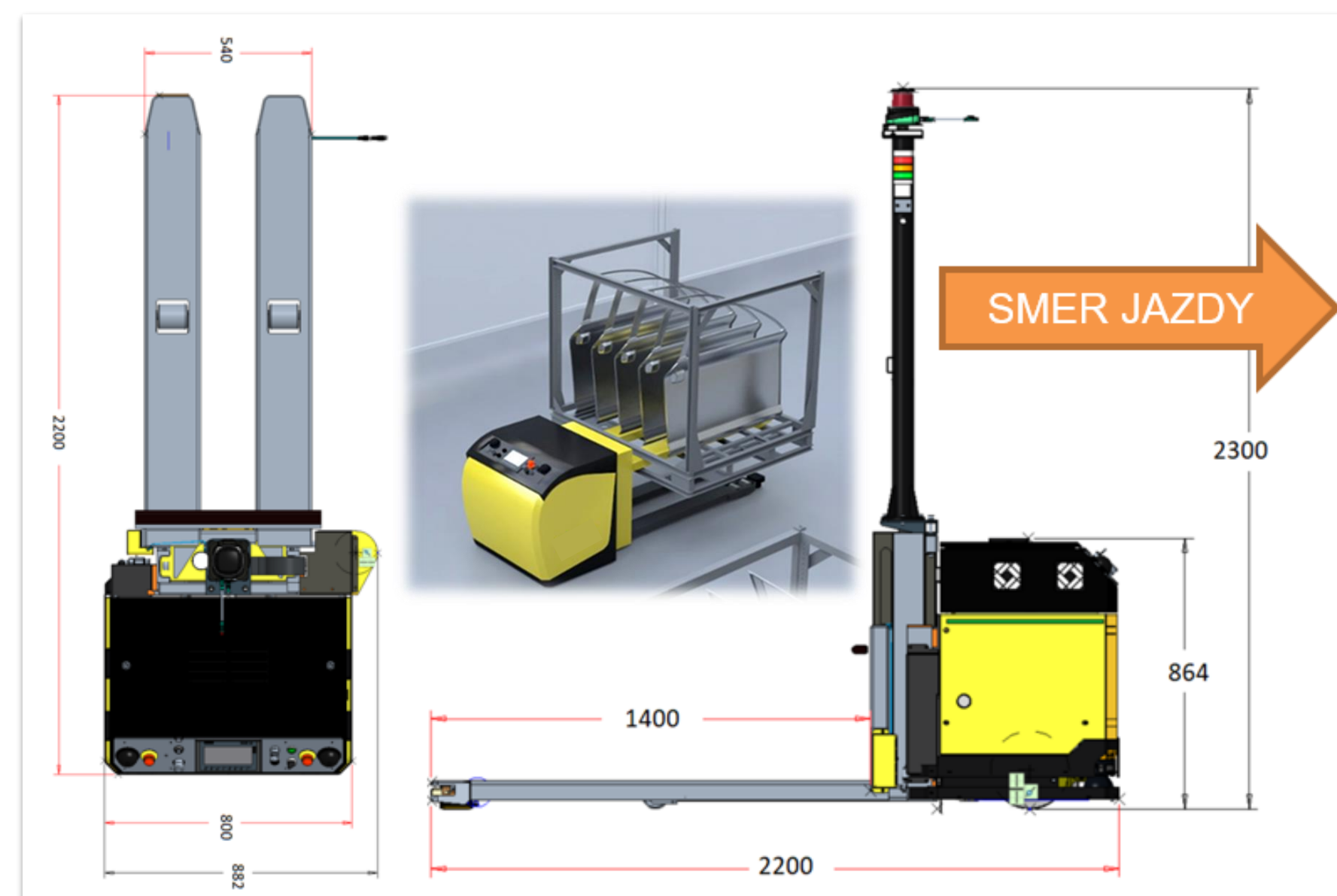
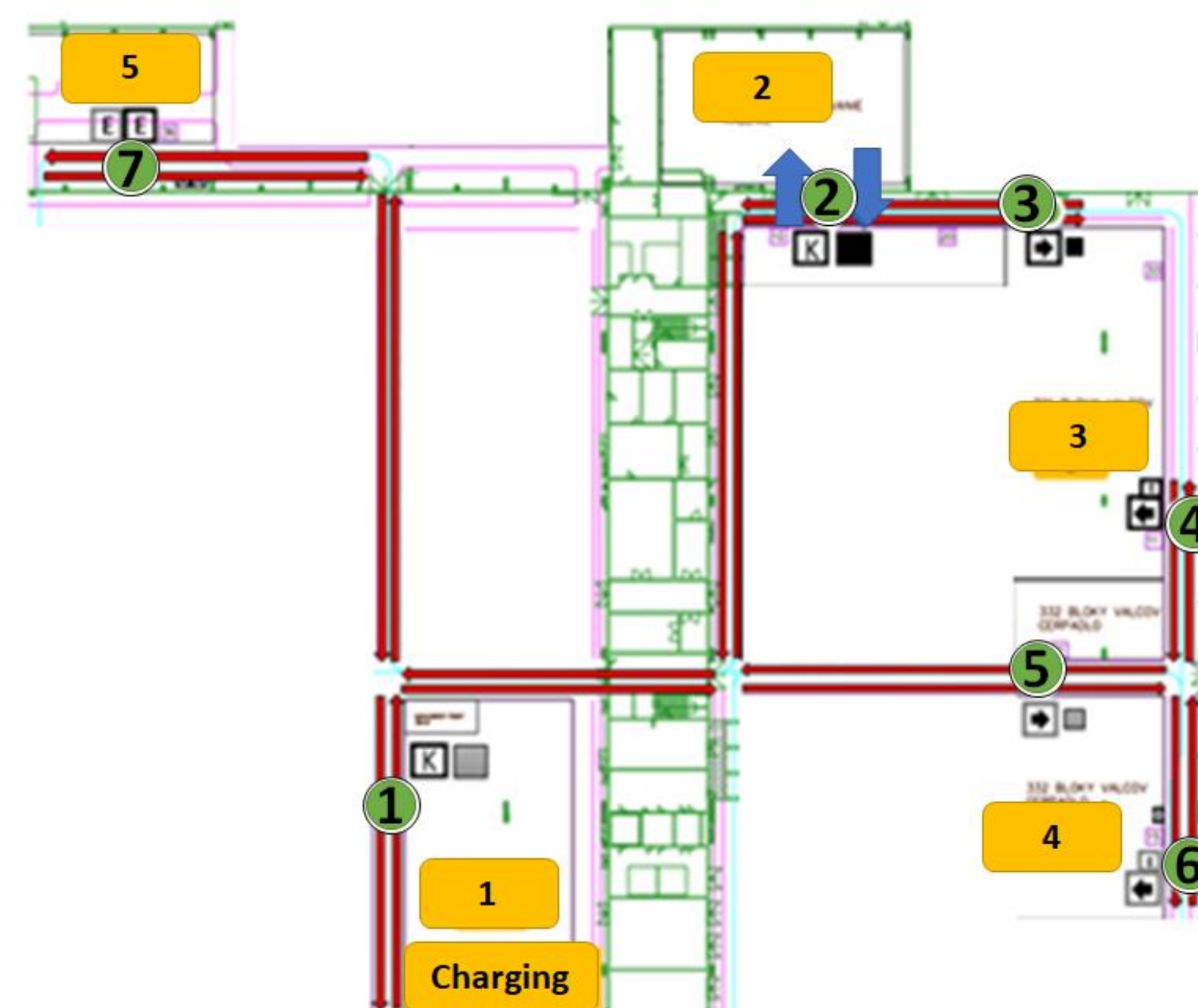
## 4. PLAN FOR THE CREATION OF AUTOMATED LOGISTICS ON THE EXAMPLE OF AGV

- Design and verifying of the Input/output places for automatic manipulations.
- Create routes and directions for the AGV truck to move
- Determine the degree of utilization of AGV

## 5. DEMONSTRATION OF FURTHER RESULTS

- Capacity calculations of a worker with a manual truck (from Monday to Thursday, on Friday)
- Capacity calculations of AGV truck utilization (from Monday to Thursday, on Friday)

ID	PO	Line	Product	Designation	Product number	Weight (kg)	Operating time	Volume / workshift	Handling unit capacity	Handling unit weight	Part
1	Blok valca Pump	1350332	Cylinder block	H1P69	11124482	3,00 kg	325,20 sek	83,03 ks	198,00 ks	594,00 kg	Polotovar
2	Blok valca Pump	1350332	Cylinder block	H1P69	11124482	3,00 kg	187,80 sek	143,77 ks	198,00 ks	594,00 kg	Puzdro Wieland
3	Blok valca Pump	1350332	Cylinder block	H1P69	11124482	3,00 kg	187,50 sek	144,00 ks	198,00 ks	594,00 kg	Pružina Spring helical
4	Blok valca Pump	1350332	Cylinder block	H1P69	11124482	3,00 kg	187,50 sek	144,00 ks	198,00 ks	594,00 kg	Podložka Washer
5	Blok valca Pump	1350332	Cylinder block	H1P69	11124482	3,00 kg	187,50 sek	144,00 ks	198,00 ks	594,00 kg	Artikel poistka
6	Blok valca Pump	1350332	Cylinder block	H1P78	11124484	2,90 kg	325,20 sek	83,03 ks	198,00 ks	574,20 kg	Polotovar
7	Blok valca Pump	1350332	Cylinder block	H1P78	11124484	2,90 kg	196,20 sek	137,61 ks	198,00 ks	574,20 kg	Puzdro Wieland
8	Blok valca Pump	1350332	Cylinder block	H1P78	11124484	2,90 kg	187,50 sek	144,00 ks	198,00 ks	574,20 kg	Pružina Spring helical
9	Blok valca Pump	1350332	Cylinder block	H1P78	11124484	2,90 kg	187,50 sek	144,00 ks	198,00 ks	574,20 kg	Podložka Washer
10	Blok valca Pump	1350332	Cylinder block	H1P78	11124484	2,90 kg	187,50 sek	144,00 ks	198,00 ks	574,20 kg	Artikel poistka
11	Blok valca Pump	1350332	Cylinder block	H1P69	11124482	3,00 kg	325,20 sek	83,03 ks	198,00 ks	594,00 kg	Polotovar



### □AGV truck

Road	Distance [m]	Time [min]	Total time [min] (PA1/ PA2)	Workload [%]	Total workload [%] (PA1/ PA2)
CW-Hardening machine-CW	273,86	13	53	2,91	11,76
CW-PA1 (EP-CW)	327,16	28		6,26	
CW-PA1 (XP-EW-CW)	475,81	12		2,59	
CW-PA2 (EP-CW)	216,41	14	21	3,13	4,68
CW-PA2 (XP-EW-CW)	473,85	7		1,55	
Sum	1767,09		74		16,44

Road	Distance [m]	Time [min]	Total time [min] (PA1/ PA2)	Workload [%]	Total workload [%] (PA1/ PA2)
CW-Hardening machine-CW	273,86	18	75	3,87	16,43
CW-PA1 (EP-CW)	327,16	39		8,68	
CW-PA1 (XP-EW-CW)	475,81	18		3,88	
CW-PA2 (EP-CW)	216,41	18	29	3,9	6,21
CW-PA2 (XP-EW-CW)	473,85	11		2,31	
Sum	1767,09		104		22,64

### □Classical hand truck

Road	Distance [m]	Time [min]	Total time [min] (PA1/ PA2)	Workload [%]	Total workload [%] (PA1/ PA2)
CW-Hardening machine-CW	273,86	15	61	3,2	13,53
CW-PA1 (EP-CW)	327,16	32		7,16	
CW-PA1 (XP-EW-CW)	475,81	14		3,17	
CW-PA2 (EP-CW)	216,41	15	24	3,27	5,17
CW-PA2 (XP-EW-CW)	473,85	9		1,9	
Sum	1767,09		85		18,7

Road	Distance [m]	Time [min]	Total time [min] (PA1/ PA2)	Workload [%]	Total workload [%] (PA1/ PA2)
CW-Hardening machine-CW	273,86	44	184	9,64	40,66
CW-PA1 (EP-CW)	327,16	97		21,5	
CW-PA1 (XP-EW-CW)	475,81	43		9,52	
CW-PA2 (EP-CW)	216,41	17	43	3,68	9,37
CW-PA2 (XP-EW-CW)	473,85	26		5,69	
Sum	1767,09		227		50,03