



Subject card

Subject name and code	Traffic and transport studies, PG_00044645						
Field of study	Badania ruchu przewozów						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2025/2026		
Education level	first-cycle studies		Subject group		Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Transportation Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Łukasz Jeliński				
	Teachers		dr inż. Łukasz Jeliński dr inż. Sławomir Grulkowski dr hab. inż. Piotr Jaskuła dr inż. Wojciech Kustra mgr inż. Konrad Biszko				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	15.0	0.0	45
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	45		5.0		25.0	75
Subject objectives	Familiarising students with a range of methods for researching traffic and transport (road and public transport) and with the practical organisation and implementation of field measurements: traffic intensity, speed/passages, passenger loads and exchanges, cordon surveys and traffic conflict analysis. Teaching students how to compile results (cartograms, indicators, reports) and formulate conclusions for transport planning and organisation purposes.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_W14] has basic knowledge of measurement techniques used to describe the phenomena which occur in transport structures and when means of transport are operated	The student distinguishes between the scope of KBR, research objectives and main techniques: manual/automatic, cordon, TR, filling, speed/travel time.	[SW1] Ocena wiedzy faktograficznej [SW2] Ocena wiedzy zawartej w prezentacji [SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym
	[K6_W17] has proficiency in transport systems as appropriate for their specialty	The student describes and classifies methods and means used to conduct traffic and transport research. The student has structured and in-depth knowledge of measurement techniques in transport and is able to select the appropriate method for performing measurements.	[SW1] Ocena wiedzy faktograficznej [SW2] Ocena wiedzy zawartej w prezentacji
	[K6_U12] able to select tools and methods, carry out assessments and simple tests of transport systems to an extent required of the specialty / learning profile	The student has the skills to select methods and assess data quality. They are able to plan and carry out measurements (location, time, health and safety, forms), prepare reports on traffic intensity/congestion/pedestrian traffic and speed.	[SU1] Ocena realizacji zadania [SU2] Ocena umiejętności analizy informacji [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU4] Ocena umiejętności korzystania z metod i narzędzi [SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania
Subject contents	Course content – lecture		
	- Objectives and scope of comprehensive traffic and transport studies (KBR); study planning. - Traffic definitions and variables: intensity, volume, speeds (V_{avg}, V_{85}), travel time, P_jU - Data sources and measurement techniques: manual vs. automatic (radar, video radar, pneumatics, video). - Selection of study area and points; schedule, time sampling, intervals. - Measurements at intersections: relationships, signalling programmes, queuing rules. - Pedestrian traffic studies: location, intervals, indicators and visualisation. - Studies of occupancy and passenger exchange in public transport: AI scale, dwell times, stop loads. - Cordon surveys and number plate comparison: application and limitations. - Analysis of speed and traffic structure in cross-section; distributors, quantiles, interpretation. - Video recording and analysis of traffic conflicts: definitions, event classification, indicator - Data processing: cleaning, aggregations, cartograms, graphs; quality control - Formulating conclusions and recommendations; good reporting practices. - Health and safety, GDPR and ethics of field research. - Case study examples and discussion of measurement errors.		
	Course content – exercises		
	- Organisation, health and safety, division into teams, choice of location; report templates. - Z1 intersection (plan): traffic intensity measurement methodology, queues, signalling programme. - Z1 development: data entry, P_jU, relation cartogram, conclusions. - Z2 pedestrians (plan): selection of routes, intervals, indicators. - Z2 development: flow cartograms, time comparisons, conclusions. - Z3 public transport (plan): filling/replacement at stops, AI scale, stopping times. - Z3 processing: filling charts, stop loads, recommendations. - Z4 conflicts (plan): 60-minute video recording, event classification, coding sheets. - Z4 analysis: tabulation of events, indicators, preparation of presentations. - Z5 speed/intensity (plan): measurement techniques, distributors, V_{85} - Z5 processing: file processing (e.g. CSV/MetroCount), distributions and interpretation. - Technical consultations and report corrections; visualisation of results. - Z4 team presentations + discussion. - Summary and comparison of locations; final conclusions.		
	Course content – project		
	- Defining the problem and research objective for the selected location (intersection/route/stops). - Preparing a report and project presentation; defending the results in class. - Developing a research plan: scope, methods, schedule, resources, health and safety, and GDPR. - Conducting field measurements; checking data quality and completeness - Data processing: cleaning, aggregation, cartograms and indicators; preparing charts. - Analysis and interpretation of results.		

Prerequisites and co-requisites	Prior knowledge/skills (required): - Fundamentals of traffic engineering: traffic volume, speed, average speed/time, PjU, generic structure, fundamentals of signalling (cycle, phases, intergreen); - basics of descriptive statistics and data processing: mean/median, deviation, percentiles/quantiles (e.g. V85), creating simple graphs and tables; - proficiency in spreadsheets (Excel/LibreOffice): data organisation, formulas, filtering, graphs; - ability to read plans/drawings of intersections and signage; - basics of video recording (use of cameras/smartphones, tripods), attention to recording quality; - soft skills: teamwork, reliability, punctuality. Additional knowledge/skills (recommended): - general knowledge of automatic measurement methods (pneumatic counters, loops, video, radar) - knowledge of health and safety rules when working in and near the road right-of-way (class 2/3 high-visibility clothing, exposure and safety rules); - basics of preparing cartograms and simple situation sketches (e.g. in QGIS/Inkscape/PowerPoint); - ability to prepare a short presentation of results (PowerPoint) and a concise report; - basic principles of data protection/anonymisation when recording video/number plates (GDPR good practices).								
Assessment methods and criteria	<table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td></td><td>60.0%</td><td>100.0%</td></tr></table>	Subject passing criteria	Passing threshold	Percentage of the final grade		60.0%	100.0%		
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Recommended reading	Basic literature	- Gaca S., Suchorzewski W., Tracz M. Inżynieria ruchu, WKŁ. - ITE Traffic Engineering Handbook (najnowsze wyd.). - TRB Highway Capacity Manual (HCM), rozdziały dot. pozyskiwania danych i analiz przepustowości. - FHWA/TRB Traffic Monitoring Guide (TMG), metody i standardy pomiarów ruchu. - Austroroads Guide to Traffic Management, Part 3: Traffic Studies and Analysis - Technika konfliktów ruchowych, Podręcznik użytkownika, Trafik 1991							
	Supplementary literature	- Roess, Prassas, McShane Traffic Engineering (5th ed.) rozdziały o gromadzeniu danych, pomiarach natężeń/prędkości i analizie wyników (kartogramy, V85). - Bonnel, Lee-Gosselin, Zmud, Madre (eds.) Transport Survey Methods: Best Practice for Decision Making metody badań podróży, kordonowe/ankietowe, planowanie i ocena jakości danych. - ITE Manual of Transportation Engineering Studies (2nd ed.) praktyczne procedury planowania i realizacji badań ruchu. - TRB, NCHRP Report 797 Guidebook on Pedestrian and Bicycle Volume Data Collection metody liczenia pieszych i rowerzystów (w tym wideo/automaty).							
	eResources addresses								
Example issues/ example questions/ tasks being completed	Sample topics/questions: - Objectives and scope of Comprehensive Traffic Surveys (CTS) - Data sources and techniques: manual vs. automatic (video, radar, pneumatic tubes) advantages, limitations, common errors. - Survey design: location selection, time sample selection, representativeness, seasonality and daily traffic profile. - Basic traffic variables: volume, mode split, speed measures (average, V85), travel time. - Pedestrian measurements: locations, time intervals, indicators and visualisation. - Public transport studies: occupancy/crowding (AI scale), passenger exchange, dwell times and stop indicators. - Licence plate comparison/cordon studies: applications and limitations (privacy, accuracy of matches). - Conflict analysis from video recordings: event taxonomy, coding sheets, key indicators and their interpretation. - Data quality control: gaps, outliers, cross-checks, field notebook. - Cartograms and dashboards: principles of clear mapping/charting and reporting for decision-making. - Safety and ethics in the field: protective measures, roadside risks, basics of GDPR/anonymisation. Examples of tasks performed: - Team measurement of an intersection and development of a relationship cartogram (report). - Pedestrian measurements in a corridor/tunnel with interval analysis (report). - Study of passenger occupancy and exchange at stops using an AI scale (report). - Hourly analysis of traffic conflicts based on video (team presentation). - Measurement of speed and traffic intensity across a road section with distribution charts and V85 interpretation (report).								
Practical activities within the subject	Field exercises								

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