THESIS REVIEWER'S REPORT

I. IDENTIFICATION DATA

Thesis title:	**Detection Of High Emitters Through Roadside Sampling**
Author's name:	**Pratyush Subhasit**
Type of thesis :	Master's thesis
Faculty/Institute:	Faculty of Mechanical Engineering
Department:	Department of Automotive, Combustion Engine and Railway Engineering
Thesis reviewer:	Martin Pechout
Reviewer's department:	Department of Vehicles and Ground Transport, Czech University of Life Sciences

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment **A**

How demanding was the assigned project?

The assignment is up to date concerning an actual topic of remote detection high emitters from currently operated fleet of cars during their regular operation. The procedure concerning both gases and particulate matter poses demanding topic appropriate to master thesis.

Fulfilment of assignment **B**

How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.

Student fulfilled the assignment. All the main goals were achieved, while there are virtually no incomplete or omitted tasks and no overextended topics included in the thesis. The reduced number of vehicle passes was caused by external causes and does not significantly reduce the thesis benefit.

Methodology **A**

Comment on the correctness of the approach and/or the solution methods.

The approach of the student is correct. Student has chosen appropriate determination of emission factor (slope factor of correlating time-aligned concentrations). Student has also taken into account various noise levels of individual instruments.

Technical level **B**

Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?

Basic technical level (data evaluation, detection of high emitters), unfortunately their presentation does not follow logical sequence. Arrangement starting with time resolved data, followed by emission factors and completed by particulate matter size spectra (e.g. showing differences among the vehicles) would be much more appropriate. Splitting of the high and low emitting passes into separated tables also reduces ease of understanding (e.g. high emitting passes of each vehicle spread through the campaign or concentrated to it part).

Unfortunately some inaccurate or incorrect statements and terms are used. For example Nitrogen oxide vs. NOx in Abstract, "Diesel Particulate Filter (DPF) which is about 90% effective", "European Legislations" without explanation they are for type-approval tests (not for the air quality) and so forth.

Atm units used for pressure instead of correct SI units or at least more common and accepted bars.

Formal and language level, scope of thesis **C**

Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?

As previously stated the results reporting part could be arranged in more logical way employing graphical representation instead of tables. Usage of graphs would also reduce need of the description and explanatory text and make the thesis easier to understand. Some sub-chapter names (such as "g/kgfuel / #/kgfuel to g/kWh / #/kWh") are also confusing.

The language is mostly understandable, but some incorrect usage of singular and plural terms are present (Particulate Matters), incorrect wording (e.g. leaves damage instead of leafs damage on page 5) devaluates it to some degree.

Chapter "Conclusions&Discussions" is non-typical mixture of two usually separated chapters. Some information given in this

part is also repeated from introduction so with to reason to be stated here (detailed instrument and health effects info).

Selection of sources, citation correctness **B**
Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?
The sources were mostly selected correctly and are cited properly. In some cases the citation reference statement is incomplete (e.g. references 15,24, 35), date of on-line sources accessing is also missing.

Additional commentary and evaluation (optional)
Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skilfulness, etc.
Strength of the thesis is the actuality of the topic used and usefulness of the procedure demonstrated while the major weakness is the way of results presentation. On other hand, student has shown skills needed for larger data processing.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

From which temperatures can be assumed NO_x is formed at considerable levels in the combustion engines?

Could you address more in detail the statement "the signals received from CTU instruments were distorted and cannot be repaired" on the page 80?

What essential ways of damage could occur to DPF causing strong decrease of its efficiency (apart of deliberate intervention).

The grade that I award for the thesis is **B.**

Date: **1.2.2022** Signature: