

EXCEEDING THE EUROPEAN NO₂-LIMIT
VALUE IN BELGIUM: CAN WE SOLVE
THE PROBLEM IN A SHORT TO MEDIUM
TIME FRAME?

Wouter Lefebvre, Hans Hooyberghs, Felix
Deutsch, Sandy Adriaenssens, Frans Fierens

TABLE OF CONTENTS

- » Introduction
- » Model Description
- » Basecase 2020
- » Backcasting
- » Conclusions

INTRODUCTION

- » European limit value for NO₂ of 40 µg/m³ (annual mean)
- » => From 2010 onwards, extension to 2015 possible.
- » Flanders (Northern part of Belgium) => extension to 2015
- » However, not met in 2015.
- » Within Joaquin-project: is it possible to keep promises by 2020, instead of 2015?

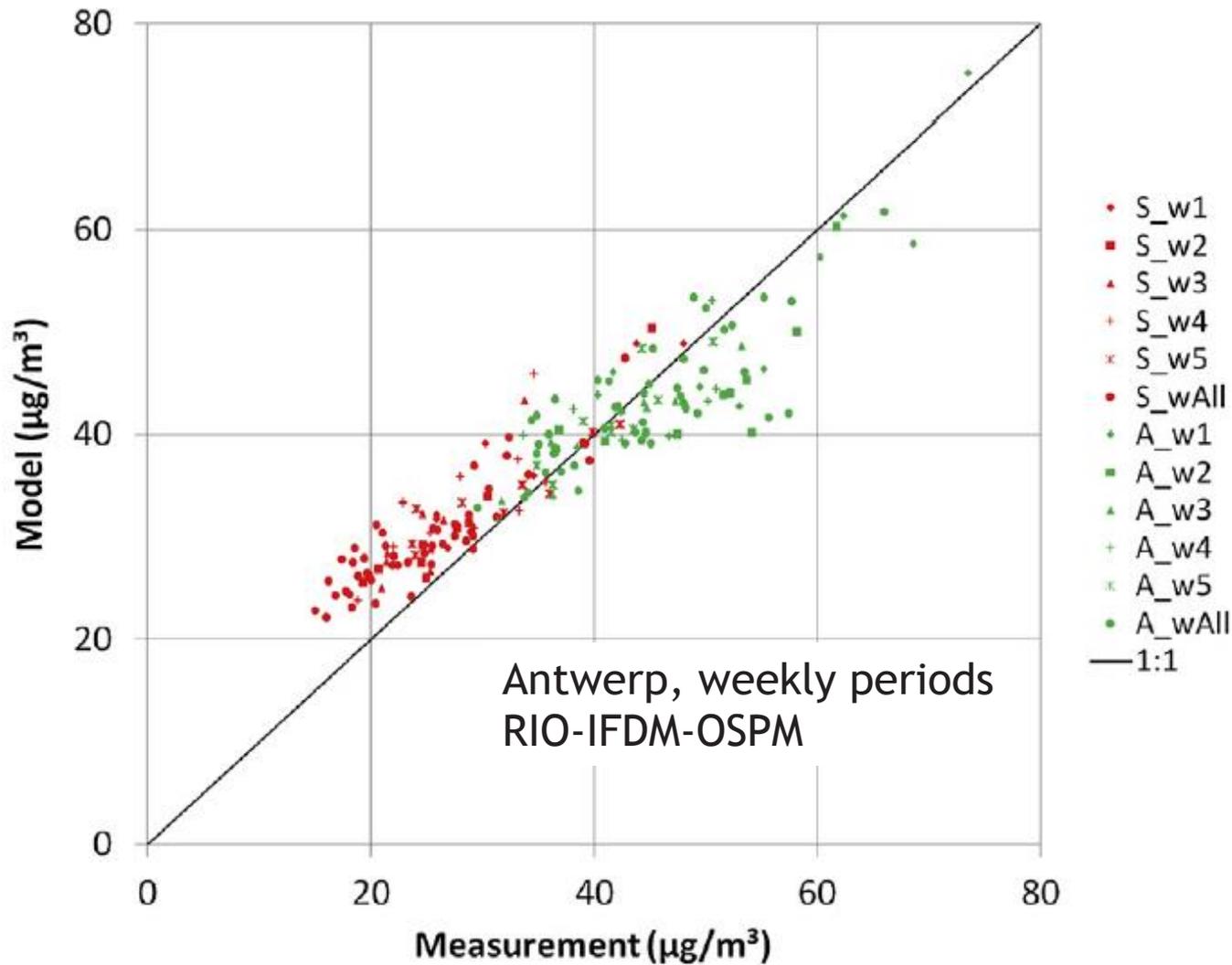
MODEL DESCRIPTION

- » Use of COPERT for road emissions
 - » However, EURO6 emissions underestimated
 - » Worst case: EURO6 = EURO4
- » RIO-Chimere-IFDM model chain
 - » Combination of Land Use Regression model (RIO) for urban background
 - » Chimere for trend lines to the future
 - » IFDM: bi-gaussian model, for the local air quality
 - » Accounting for double counting (Lefebvre et al., 2011)

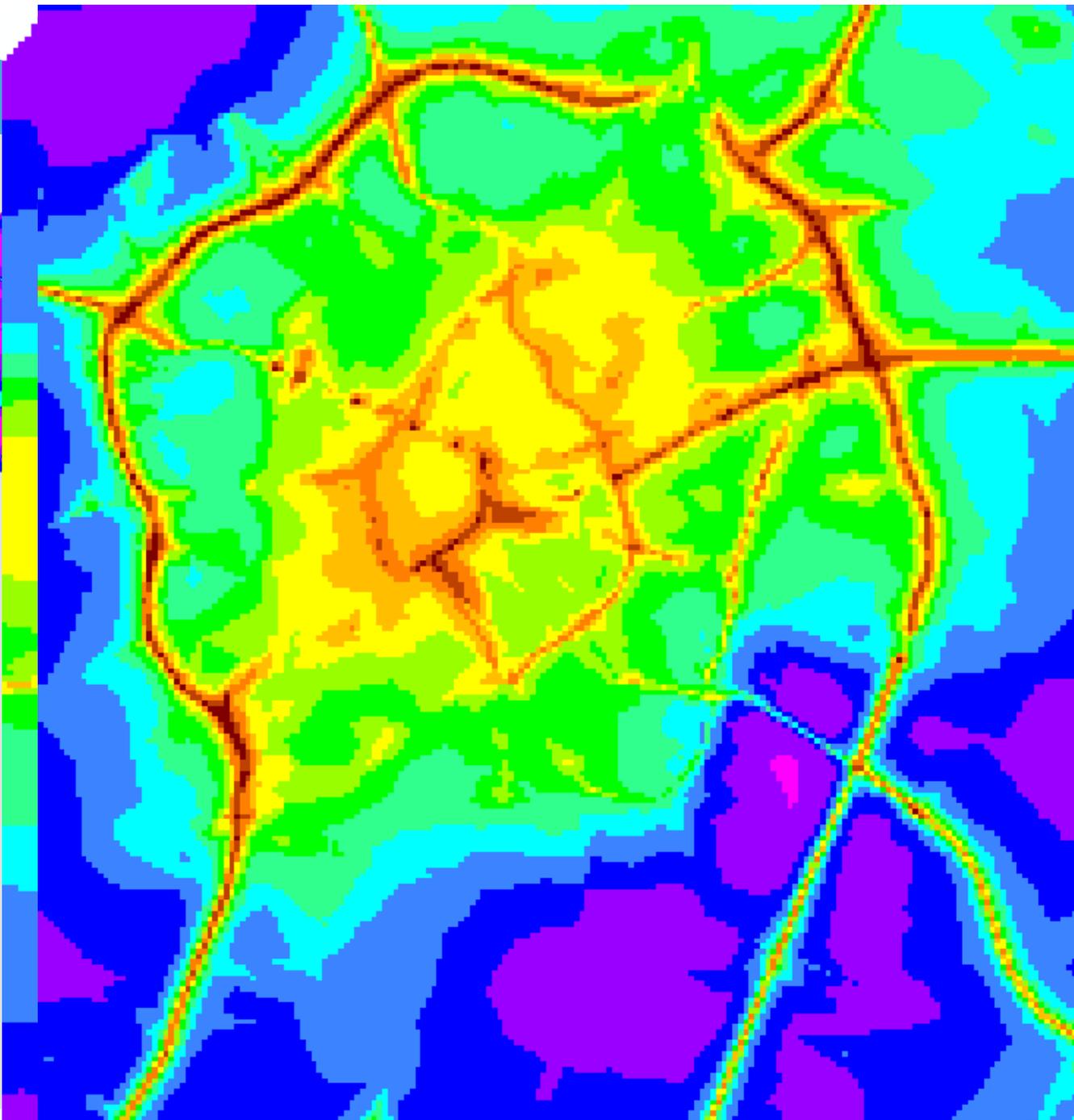
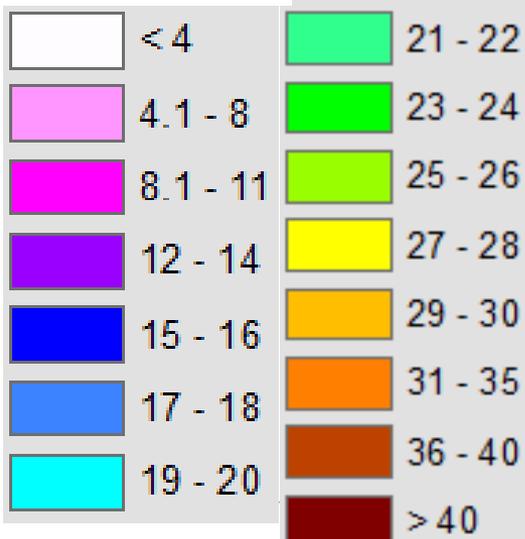
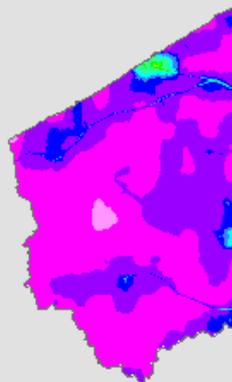
MODEL DESCRIPTION

- » Is the model capable?
 - » Well-validated model (e.g. Lefebvre et al., 2013)
- » No street canyons taken into account
- » Meteorology: 2009, 1x1 km² resolution, assimilated

MODEL VALIDATION: SOME EXAMPLES

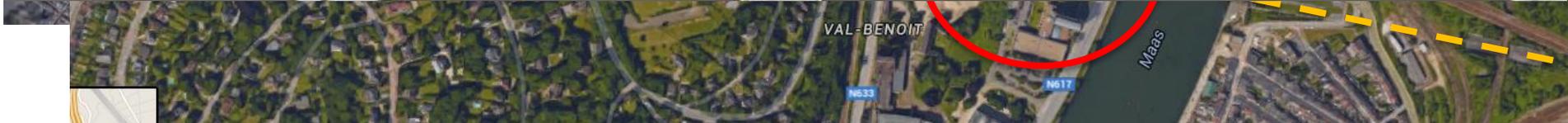


BASECASE 2020



- » Locations with exceedances:
 - » Series of major tunnel exits
 - » Major parts of Antwerp and Brussels Ring Roads and their immediate surroundings
 - » Parts of the Brussels City centre

IMPORTANT? PEOPLE ARE LIVING HERE!

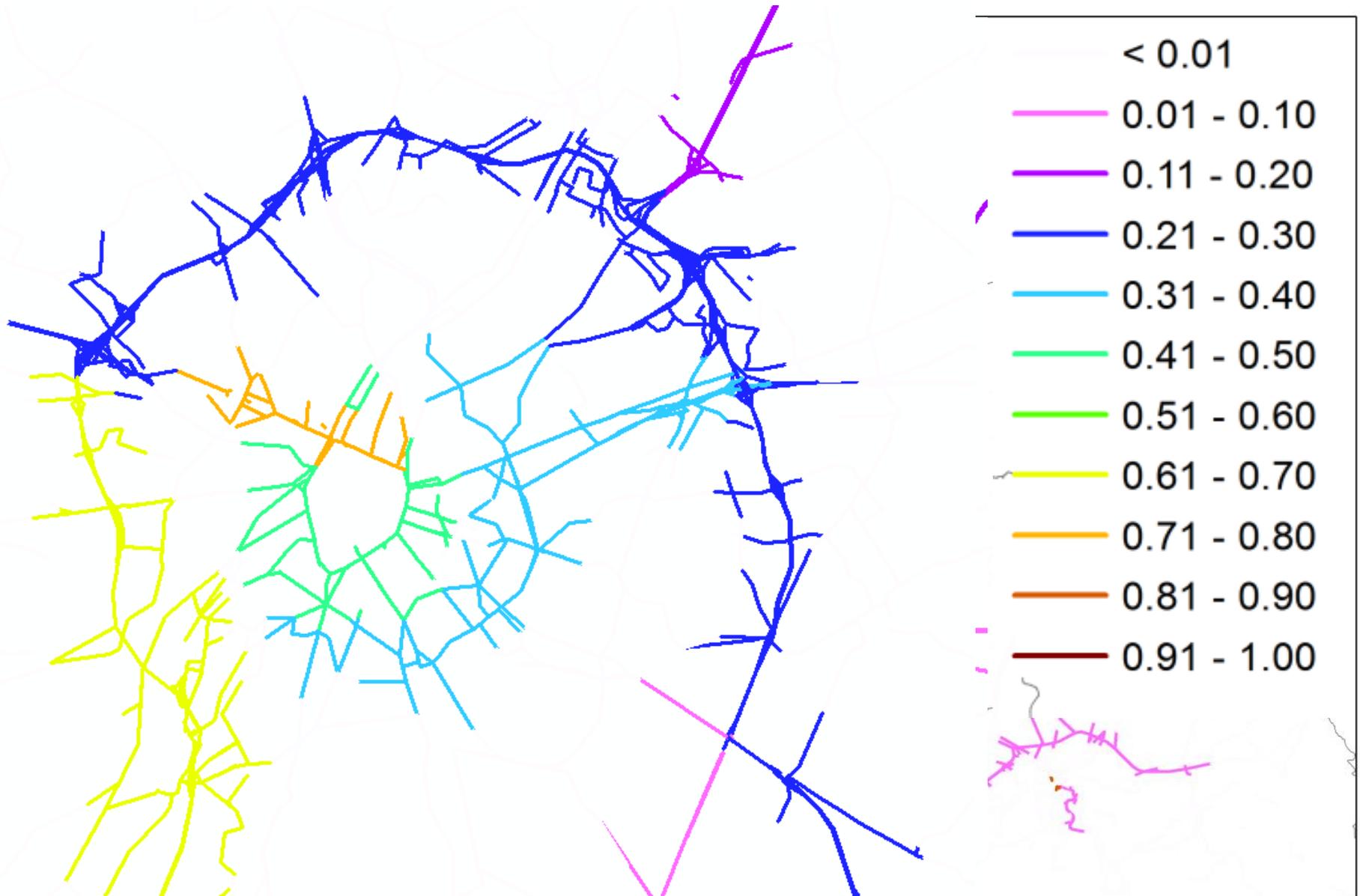


- » Emission reductions needed determined by backcasting:
 - » Find grid cells with exceedances
 - » Split concentration in background/local contribution
 - » Reduce local contribution until no exceedances found

BACKCASTING

- » Emission reductions needed of 67-83% at four major tunnel exits
- » Ignoring tunnel exits: emission reductions needed up to more than 50%

BACKCASTING: NEEDED RELATIVE REDUCTION



CONCLUSIONS

- » Emission reductions of >50% by 2020 seem unrealistic
- » It will be very difficult to attain European limit values (at every location, not only measurement locations) by 2020
- » Taking into account street canyons will exacerbate the problem
- » Complete shift for passenger cars away from diesel is needed for quick compliance.