

# Virtually Invisible Small-cells for 5G Densification

**Cities as a challenge for ICT technologies**

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# INTRODUCTION



## Introduction

Problem formulation

What is the problem to be addressed?



[Source: <http://www.one-wilshire.com/connectivity/rooftop-spaces-wireless/>]



[Source: <https://www.maison-travaux.fr/maison-travaux/conseils-pratiques/orienter-antenne-satellite-115483.html>]

**5G**  
INVISIBLE 5G



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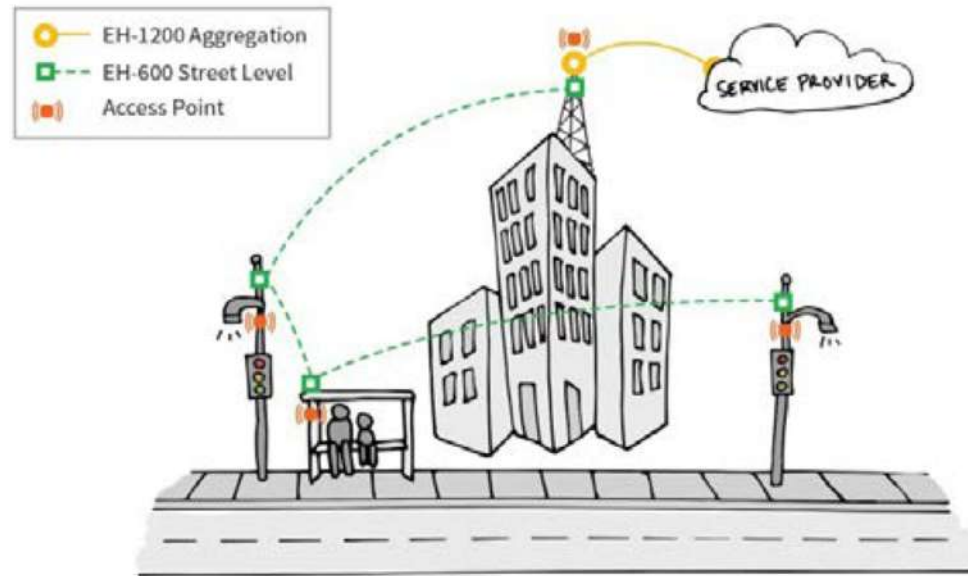
## CHALLENGES FOR 5G



### Challenges

5G network densification

- The role of street furniture in expanding mobile broadband?
  - **Small-cells: it is less a “nice to have” and more of an operational “must-have”!**



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## CHALLENGES FOR 5G



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5G network  
densification

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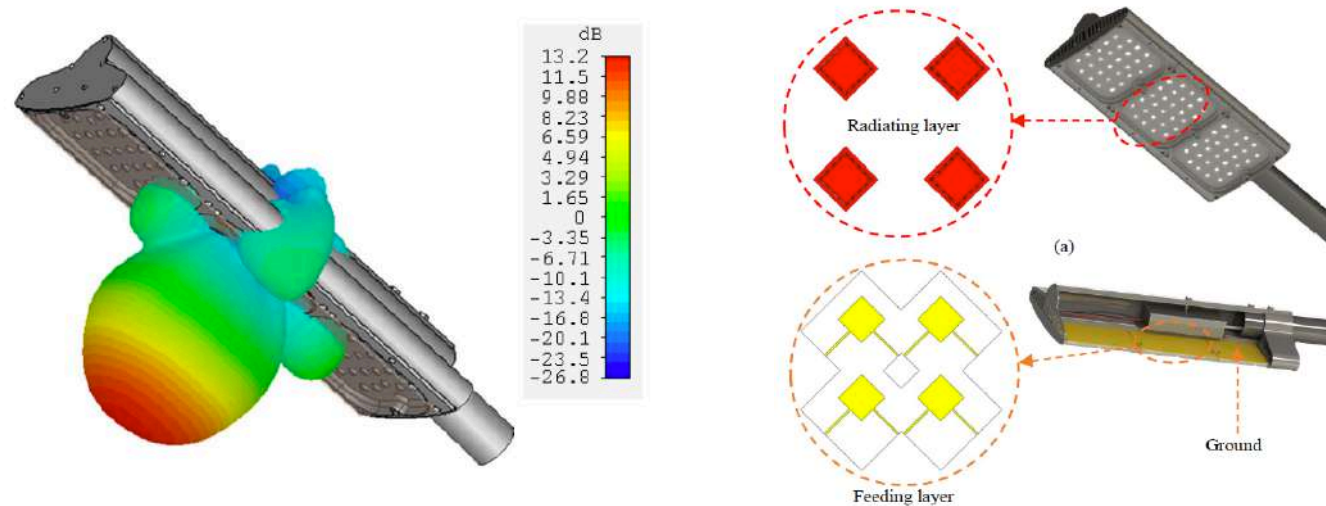


## SOLUTIONS



Solutions

- 5G Small-cells, low power, small-form factor, highly concealed, ruggedized and easy-to-deploy >> **ASSIMILATED INTO STREET LANDSCAPING**



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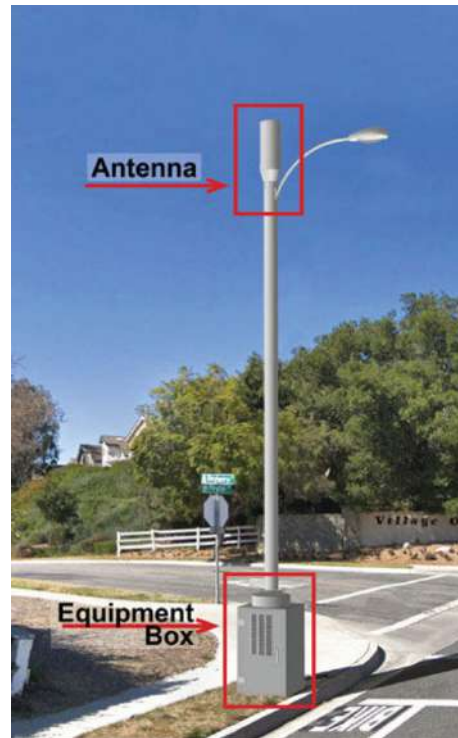
A. Alieldin et al., "A Camouflage Antenna Array Integrated with a Street Lamp for 5G Picocell Base Stations," 2019 13th European Conference on Antennas and Propagation (EuCAP), Krakow, Poland, 2019, pp. 1-4.

## SOLUTIONS



Solutions

- The role of street furniture in expanding mobile broadband?



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## SOLUTIONS



Solutions

- The role of street furniture in expanding mobile broadband?



[Source: COMMSCOPE]

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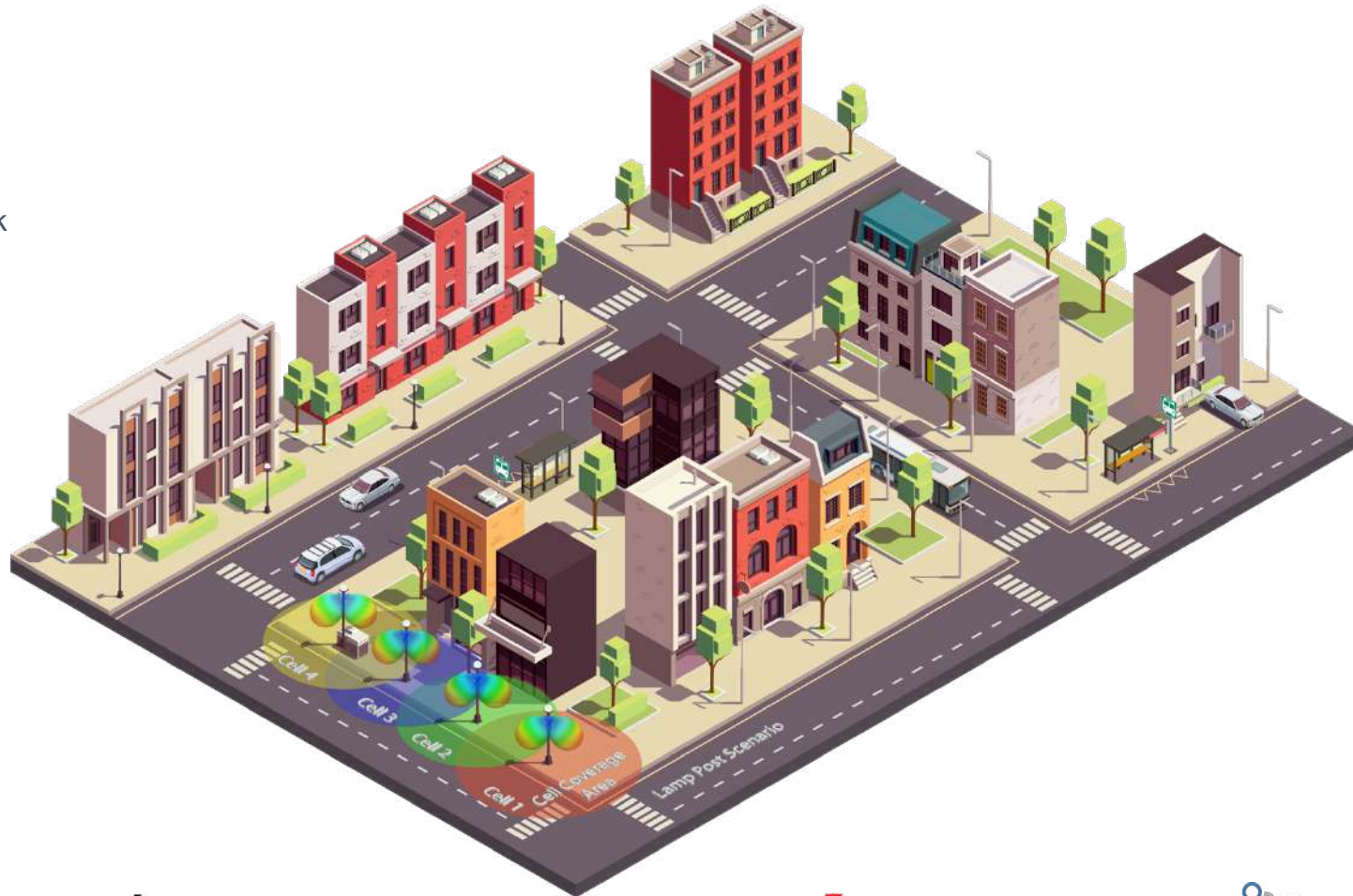
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# Project INVISIBLE 5G



On-going work



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