

## Urban redevelopment and transport infrastructure

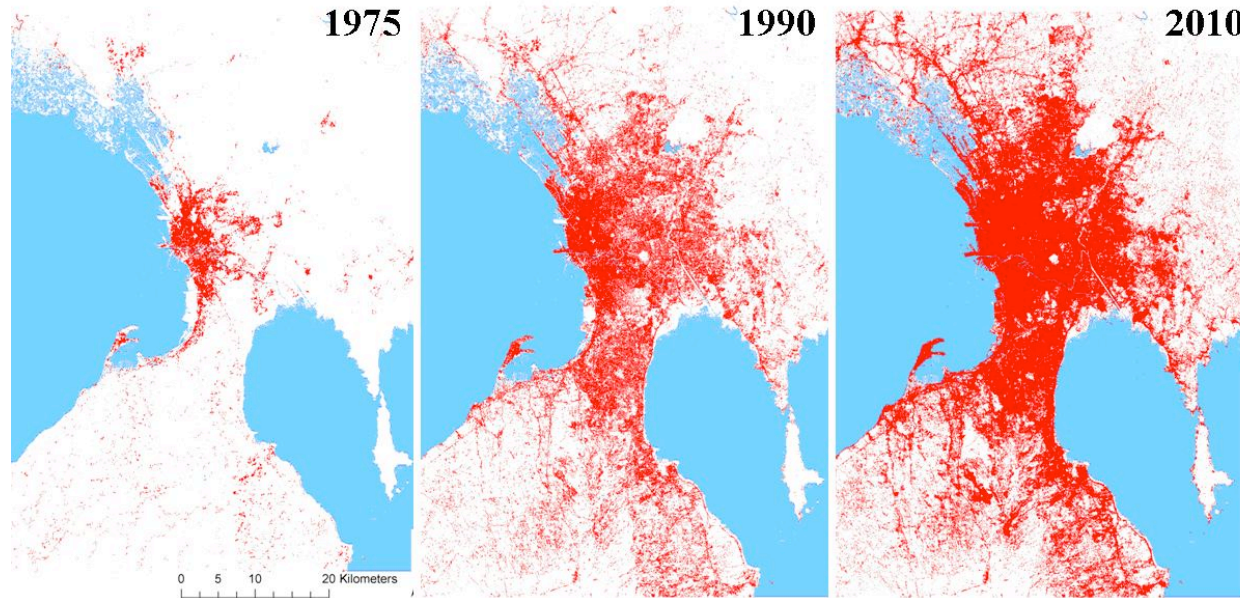
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Department of Architecture

University of Cambridge



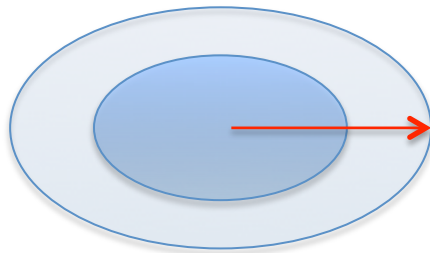
- 2.2 billion people will be added to the world population between 2000 and 2030
- 2.1 billion will be urban dwellers



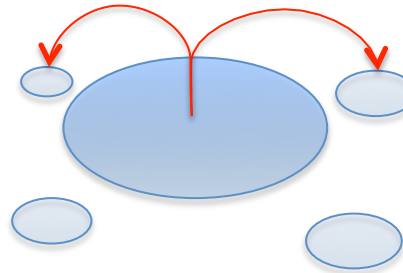
Growth of Manila, Philippines. Source: DLR-DFD

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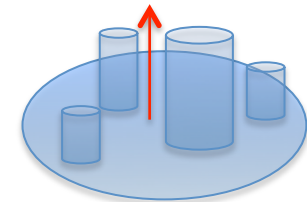
## Three ways to accommodate urban growth



suburbanisation



new towns



redevelopment

- 2.2 billion people will be added to the world population between 2000 and 2030
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Redevelopment becomes increasingly more important

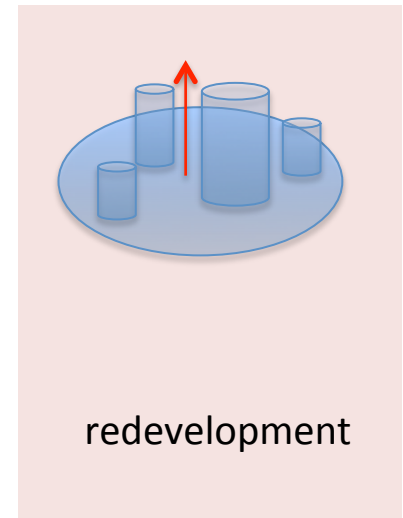
## Questions

- Where does it take place?
- What are the dynamics?
- What are the key conditions?
- What is the role of infrastructure?

## Policy implications

- Establish knowledgebase for smart cities
- Develop better land use models
- Develop standards for infrastructure provision
- Facilitate efficient use of resources

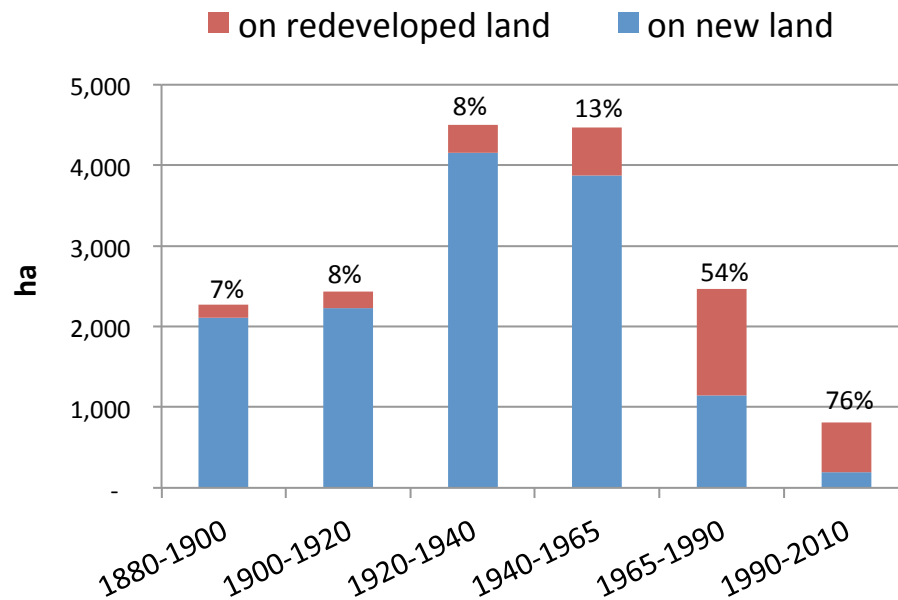
**most efficient use of existing resources**





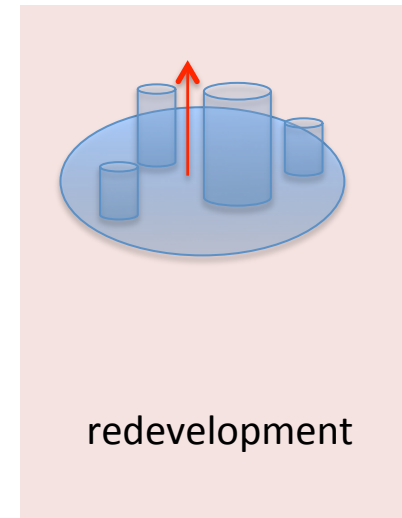
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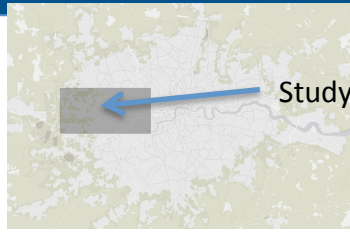
Redevelopment becomes increasingly more important



West London land development 1880-2010

most efficient use of existing resources



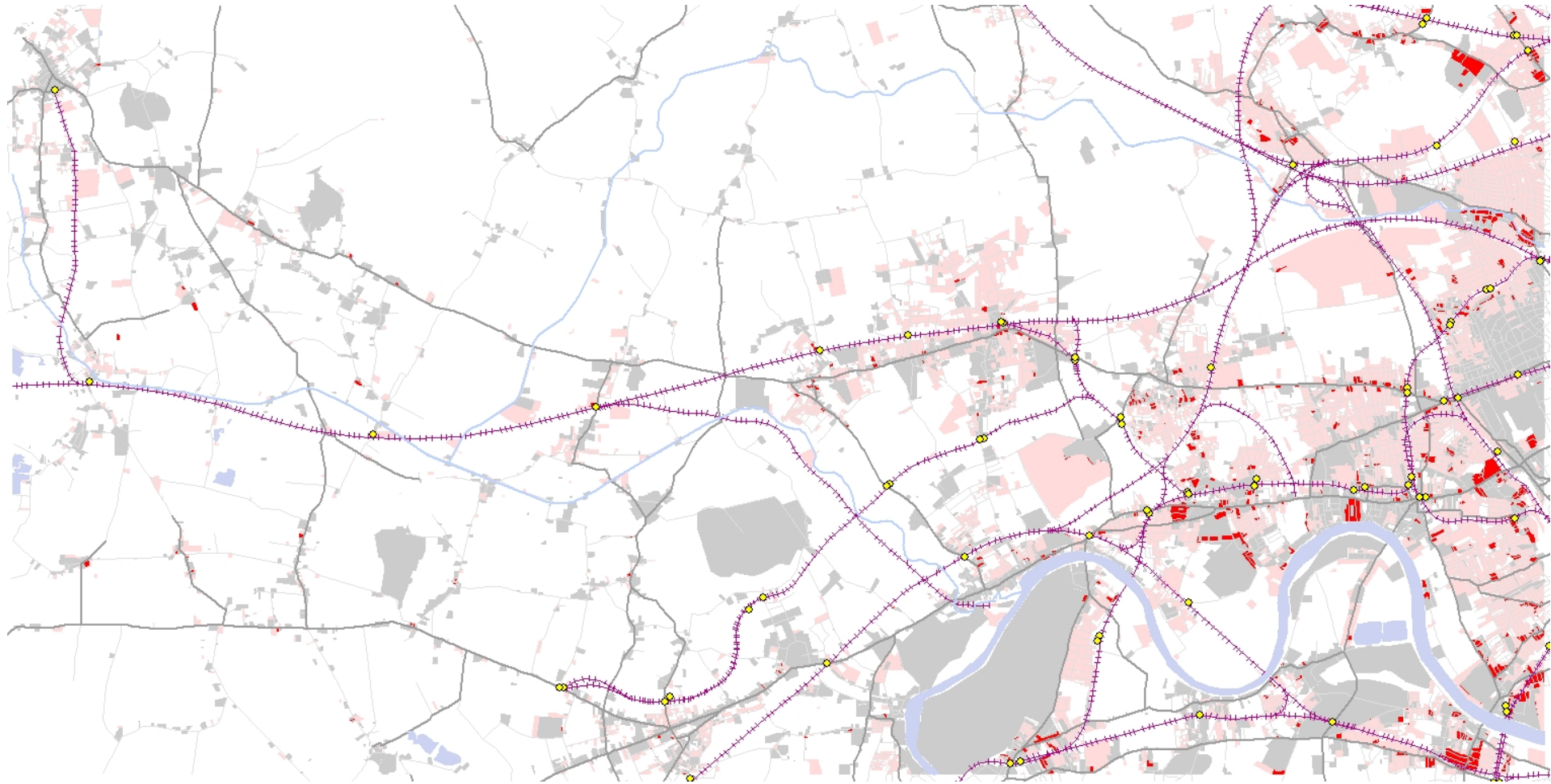


Study area

## land development 1880-1900

- railway station
- redevelopment
- new development
- pre-existing development

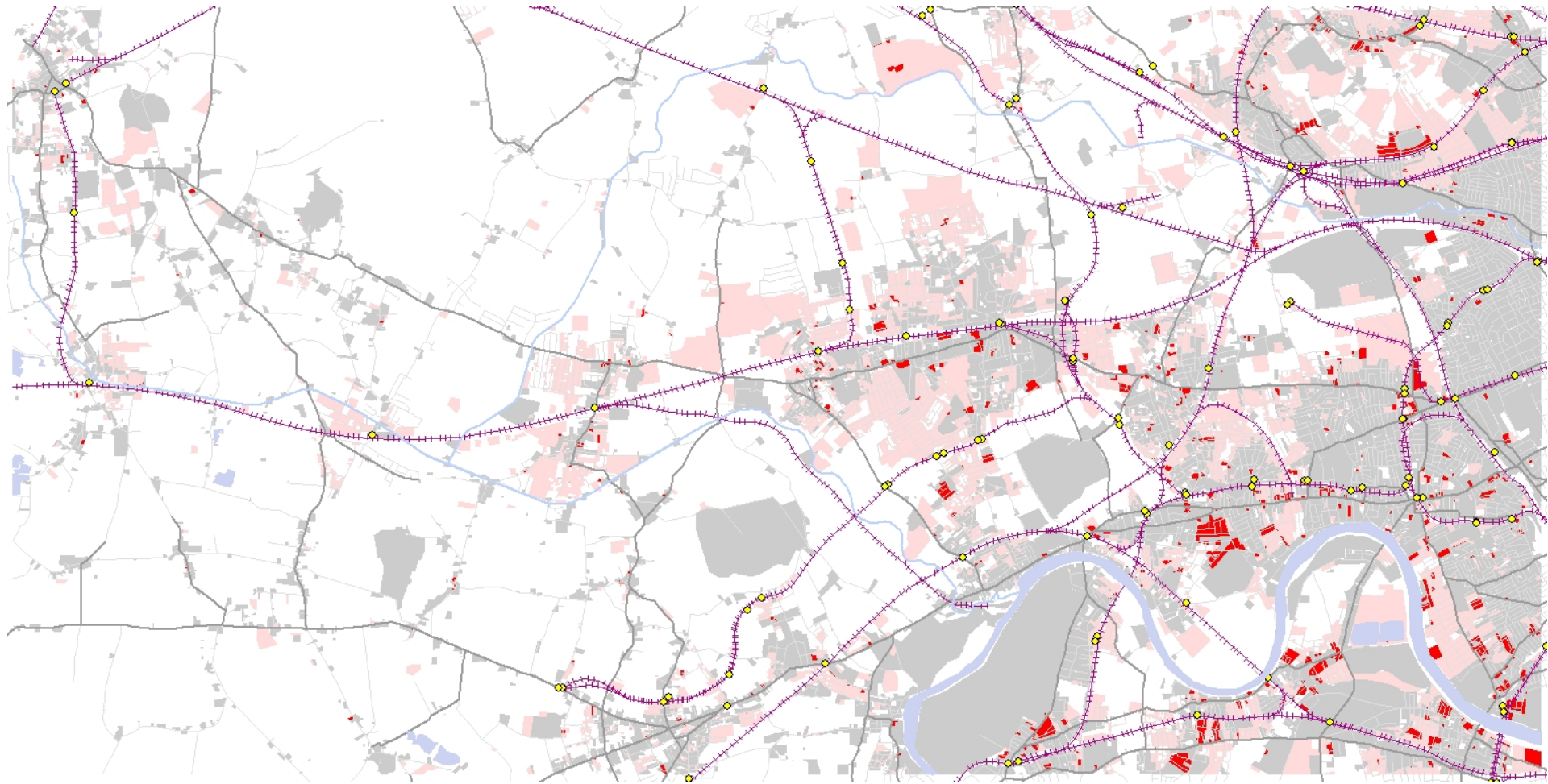
0 2.5 5 km



## land development 1900-1920

- railway station
- redevelopment
- new development
- pre-existing development

0 2.5 5 km

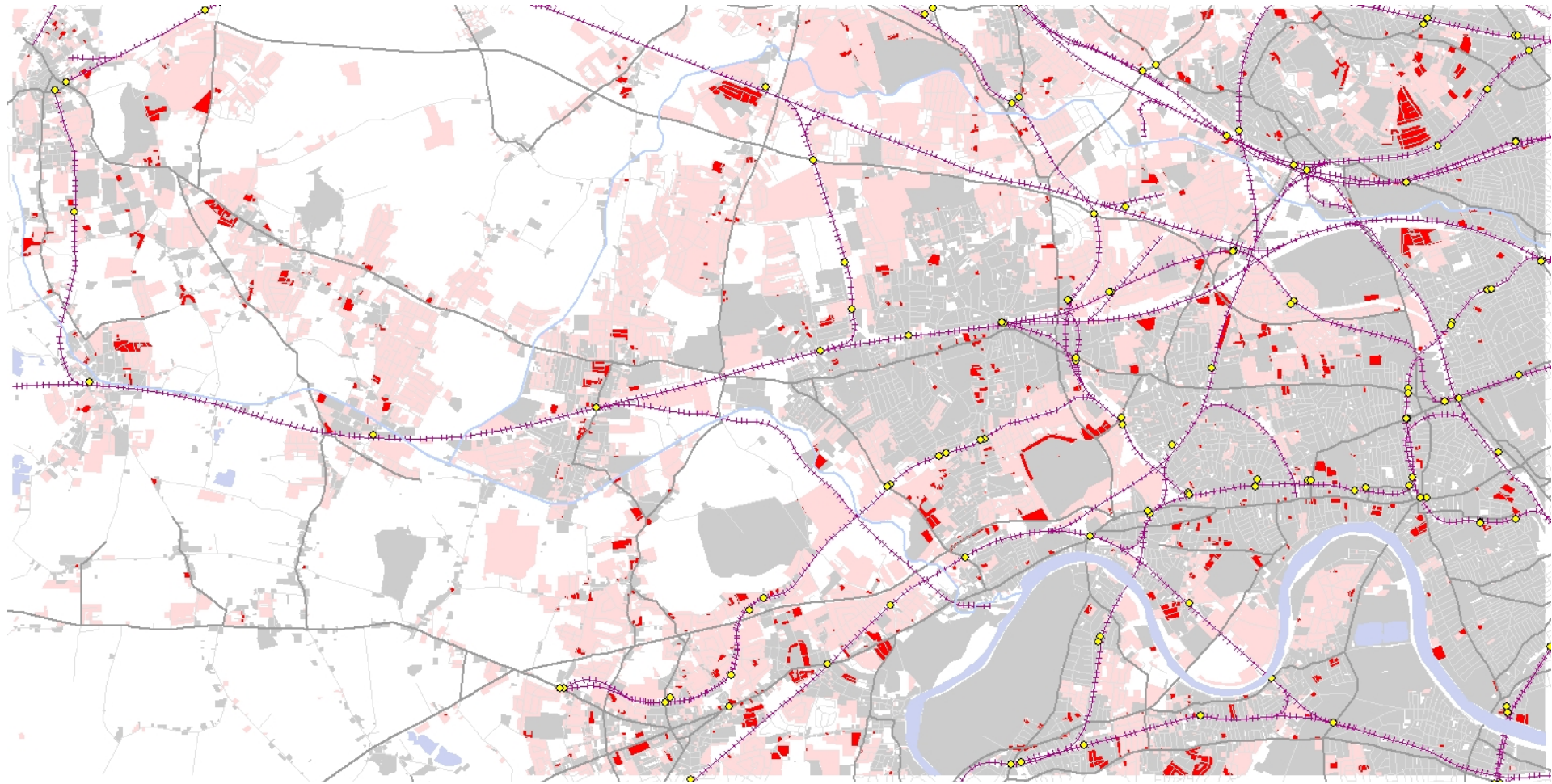




## land development 1920-1940

- railway station
- redevelopment
- new development
- pre-existing development

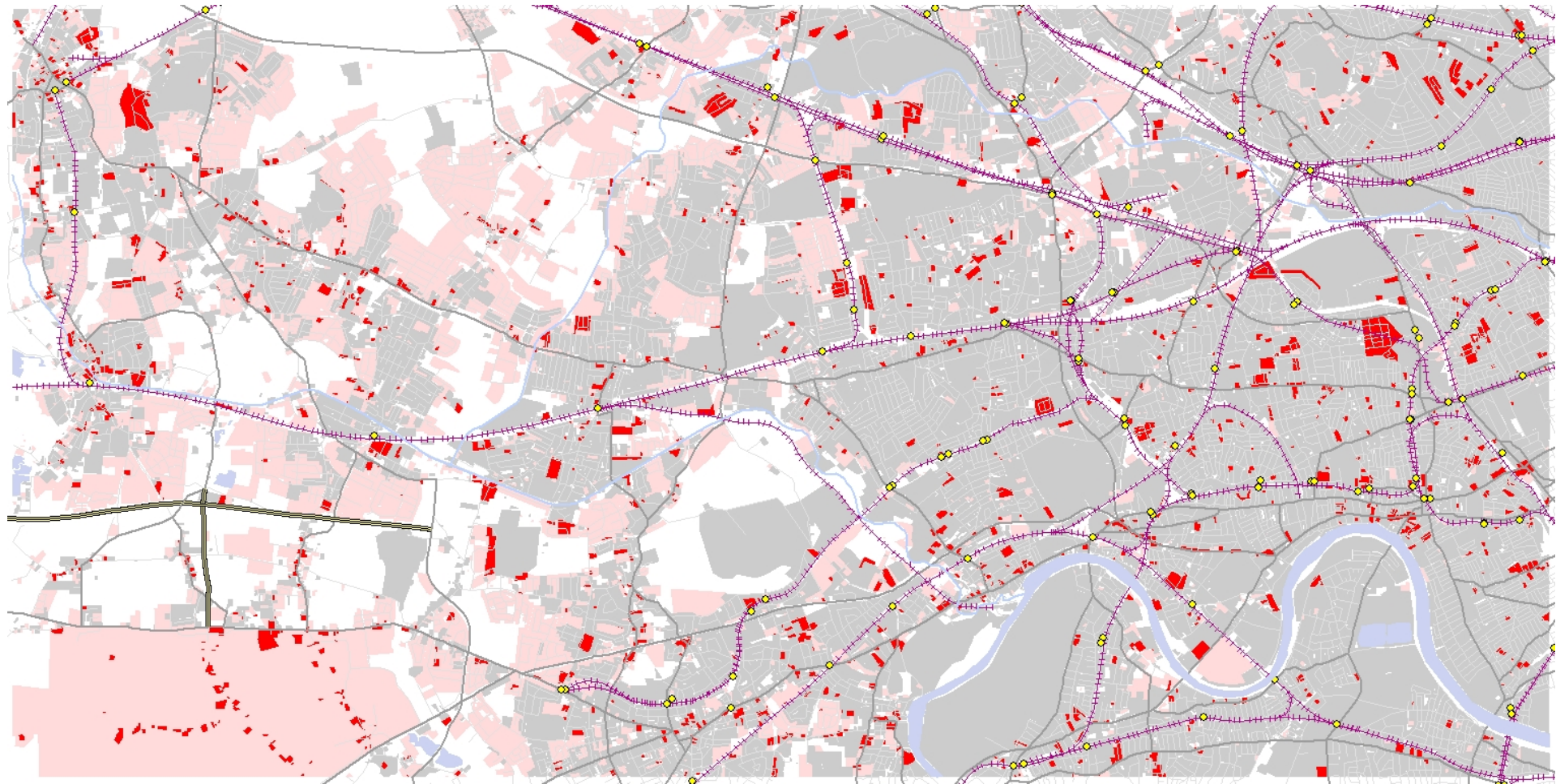
0 2.5 5 km



## land development 1940-1965

- railway station
- redevelopment
- new development
- pre-existing development

0 2.5 5 km

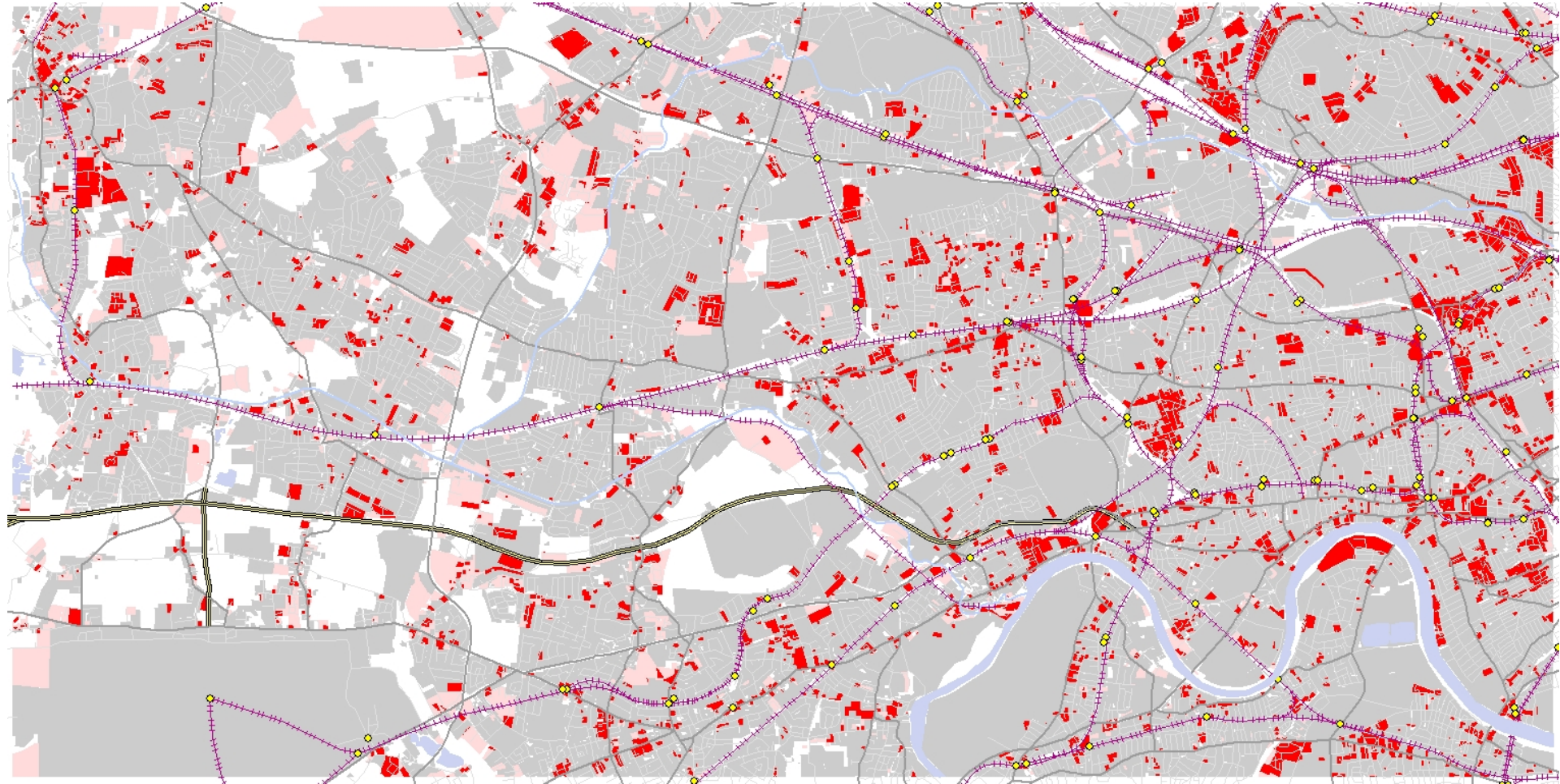




## land development 1965-1990

- railway station
- redevelopment
- new development
- pre-existing development

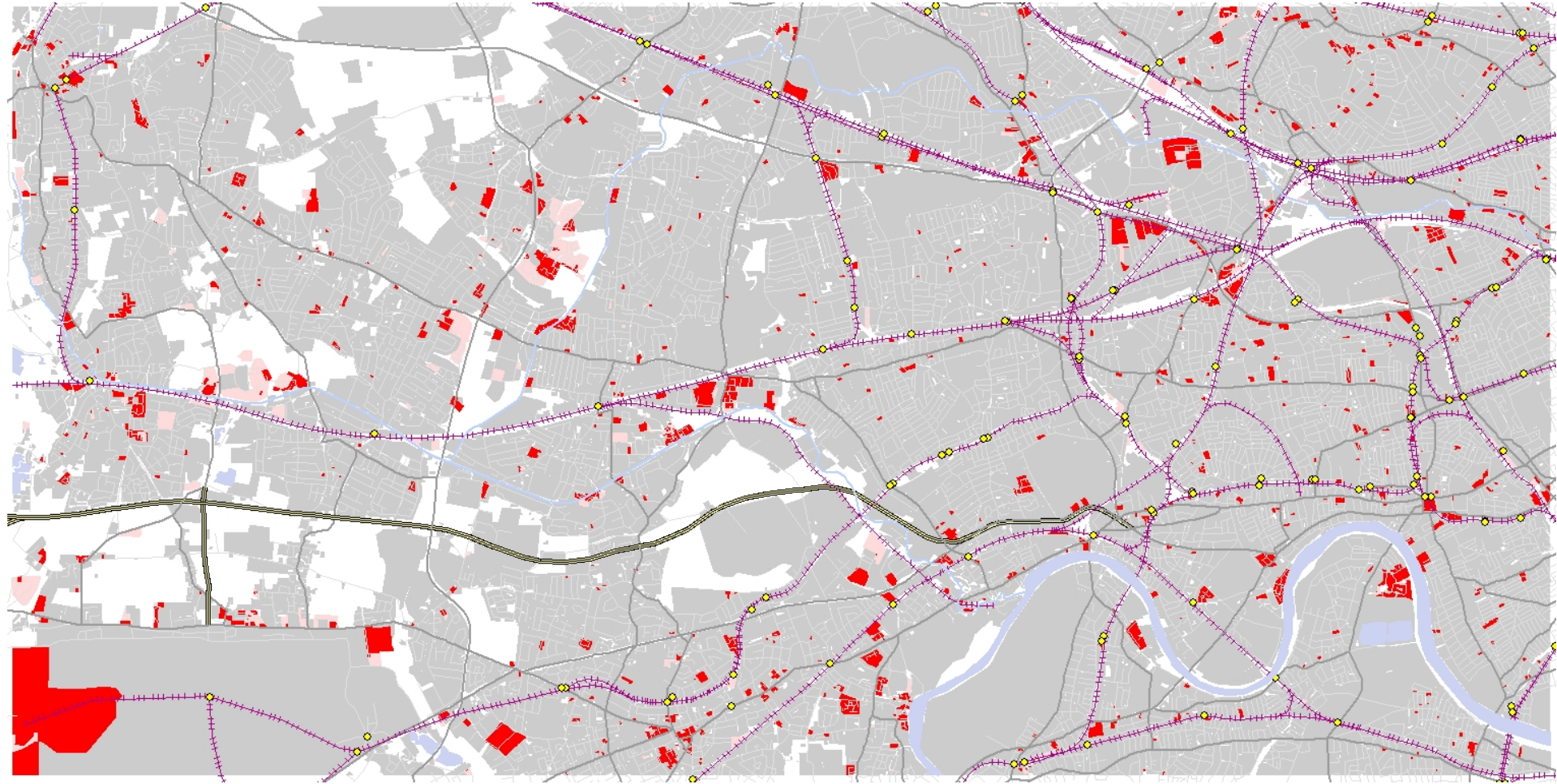
0 2.5 5 km



## land development 1990-2010

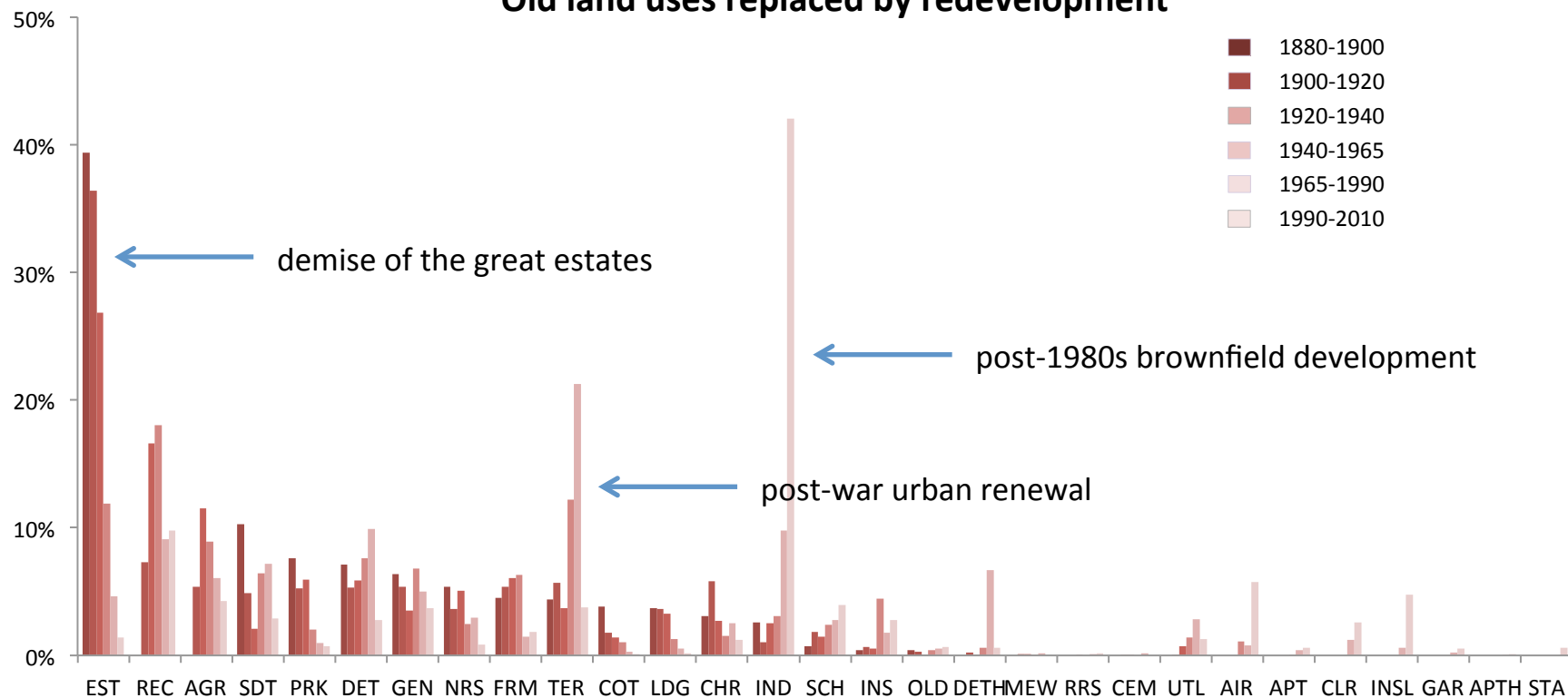
- railway station
- redevelopment
- new development
- pre-existing development

0 2.5 5 km



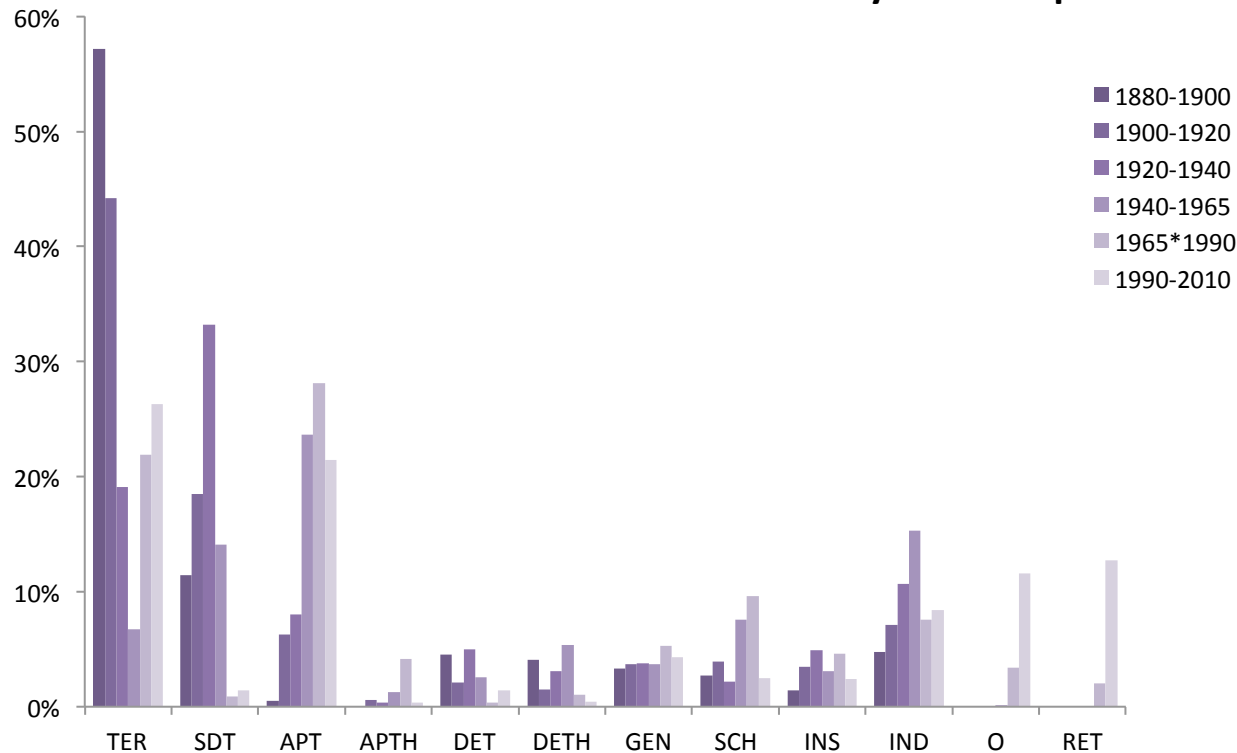


## Old land uses replaced by redevelopment



- Low intensity uses most prone to redevelopment in the early periods
- Medium-density residential targeted during the WW2 reconstruction
- Brownfield redevelopment in the post-industrial age

## New land uses established by redevelopment



- Share of housing gradually decreasing - from 3/4 to 1/2 of the converted land
- Share of industrial gradually increasing until 1960s, dropping down to half of that rate thereafter
- Share of commercial dramatically increasing after 1960s due to expansion of office and retail

## Distance from St Paul

- Development clustered around the core
- Secondary nodes forming

- Dispersal away from the core
- Number of secondary nodes increasing

- Development relatively evenly dispersed

development

redevelopment

1880-1900

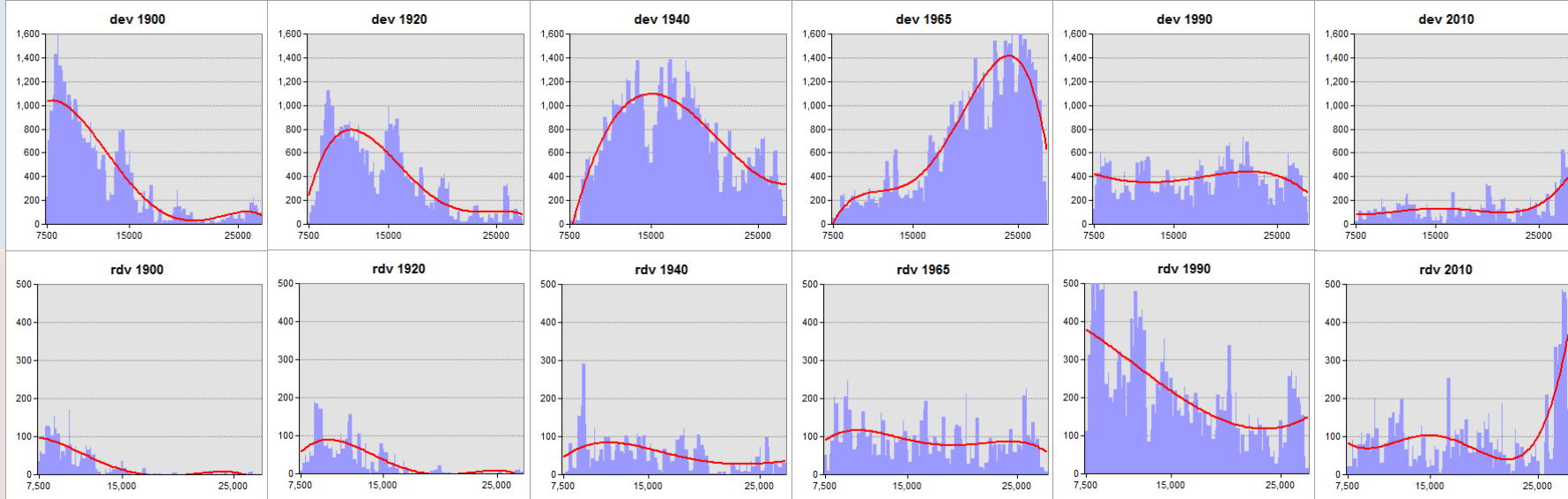
1900-1920

1920-1940

1940-1965

1965-1990

1999-2010



- Redevelopment clustered even more tightly around the core
- Redevelopment present in secondary nodes as well

- Clustering of redevelopment around the core is weakened but still notable

- Redevelopment is relatively evenly dispersed

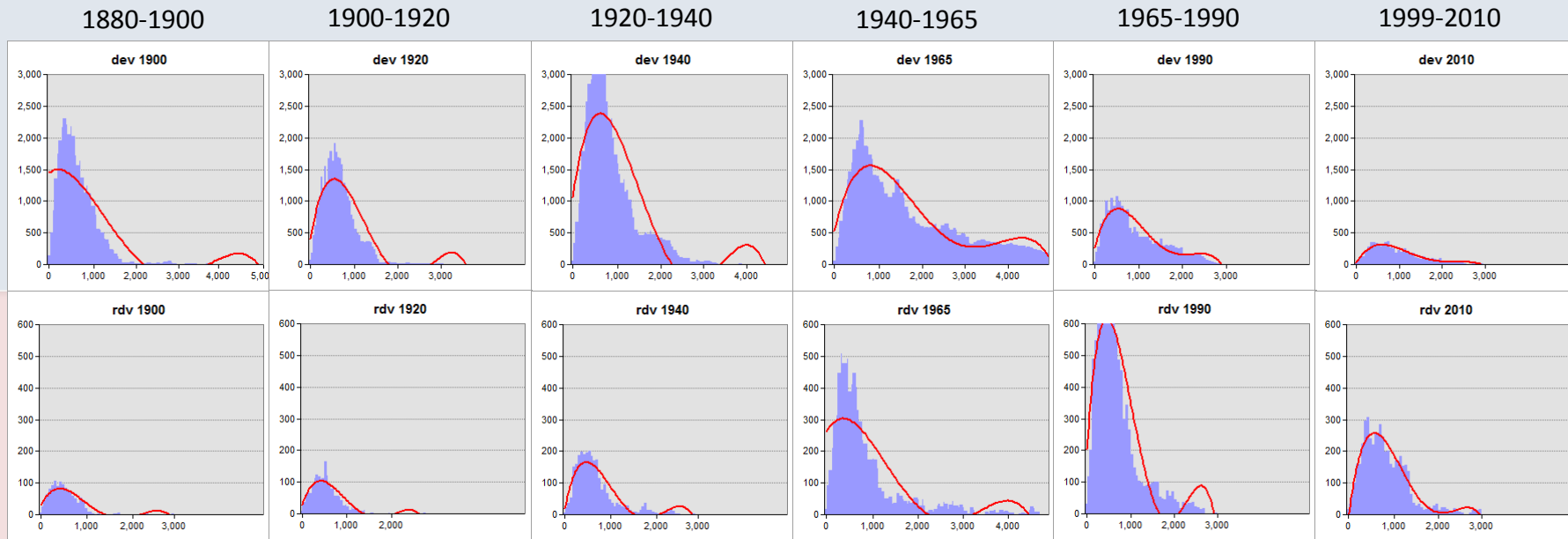


## Distance from stations

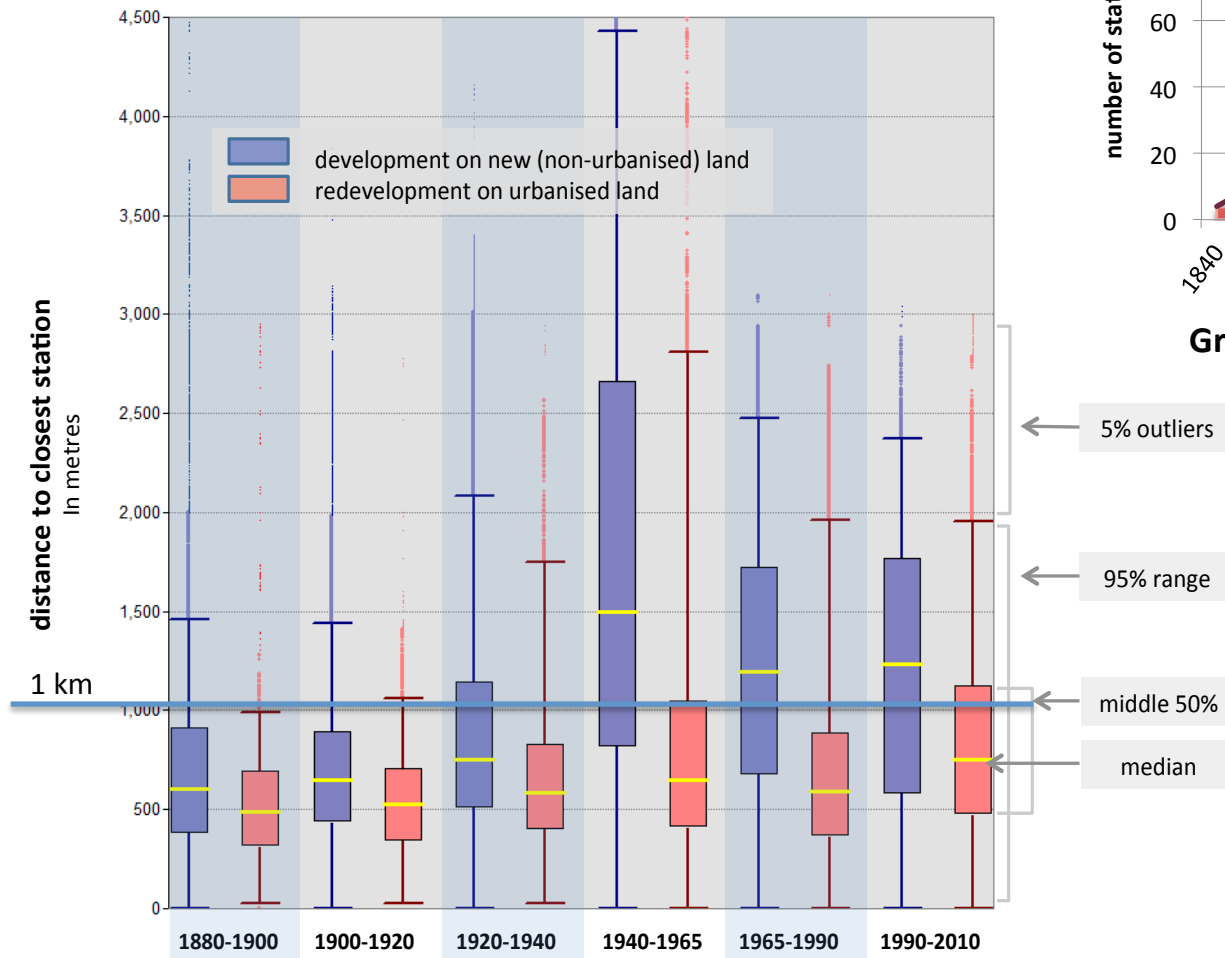
- The majority of development is clustered around the stations
- Since the interwar period this relationship has been loosening with time
- The post-WW2 decades showing the greatest dispersal

development

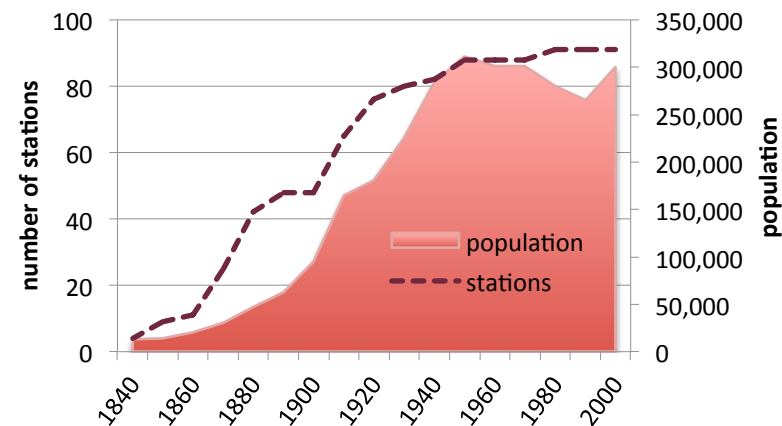
redevelopment



- The overwhelming majority of redevelopment is clustered around the stations
- This relationship has remained relatively stable



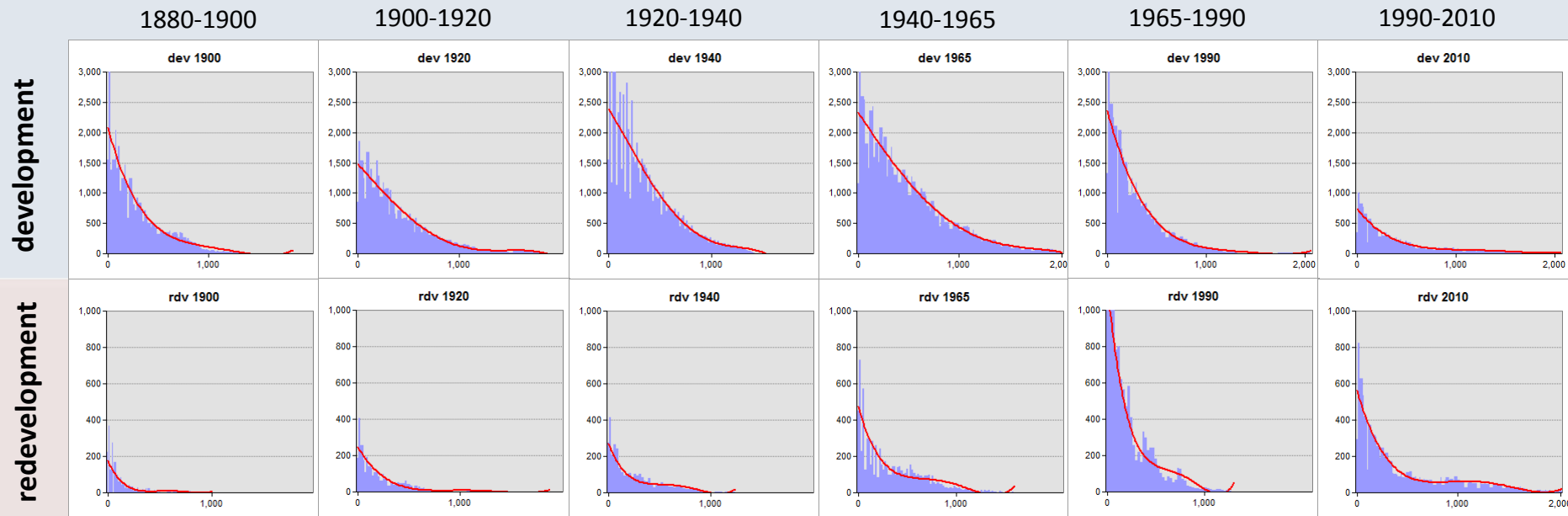
Land development by distance to closest station



Growth of population and rail network

## Distance from major roads

- The clustering of development along the major roads is remarkably consistent over time
- During the interwar and post-WW2 decades this relationship is somewhat loosening
- Since the 1960s development is more strongly related to the location of major roads again

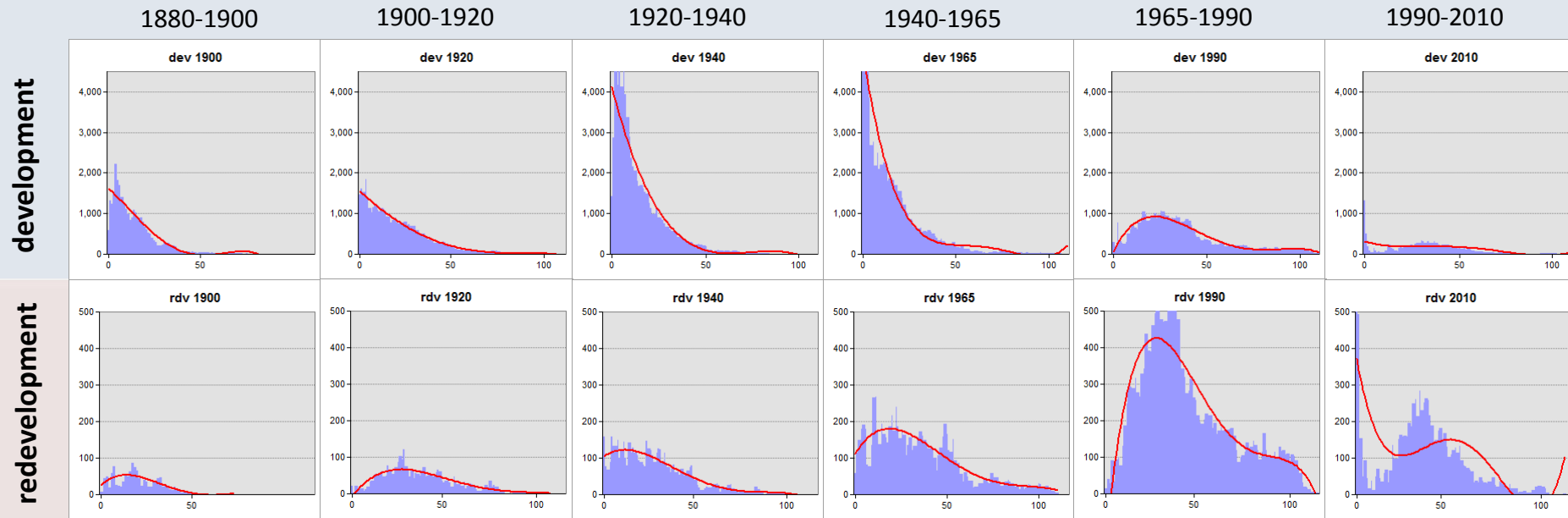


- The overwhelming majority of redevelopment has been clustered along major roads
- This relationship has been loosening with time

## Relationship to intersection density

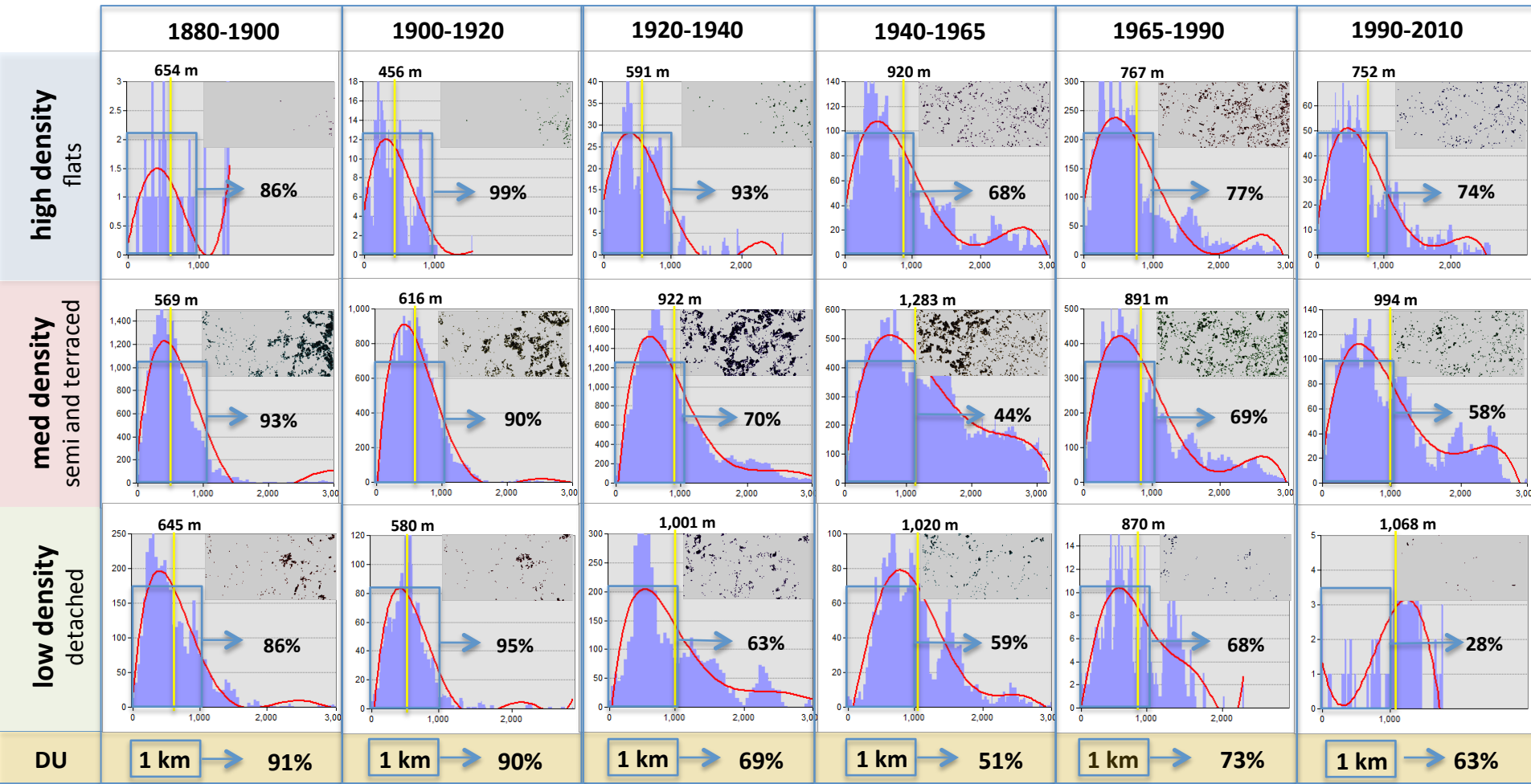
using lagged density

- Until the 1960s most development was located in areas with low intersection density (development on new/non-urbanised land in the outskirts)
- Since the 1960s development has taken place in areas with relatively higher intersection density (reflecting the larger share of redevelopment)



- The majority of redevelopment has taken place in areas with low to moderate intersection density
- This relationship has been remarkably consistent over time

# residential land development by distance from stations *ha of land*





## Conclusions

- The share of redevelopment has been increasing systematically since the mid-20<sup>th</sup> century
- Transport infrastructure has been a key factor in redevelopment
- The relationship between transport infrastructure and redevelopment is systematic and consistent
- Accessibility to rail networks is a dominant factor shaping urban spatial restructuring

The insights derived from this line of empirical research could serve to develop better land use models, standards for infrastructure provision, and facilitate a more efficient approach to the use of urban land resources.

