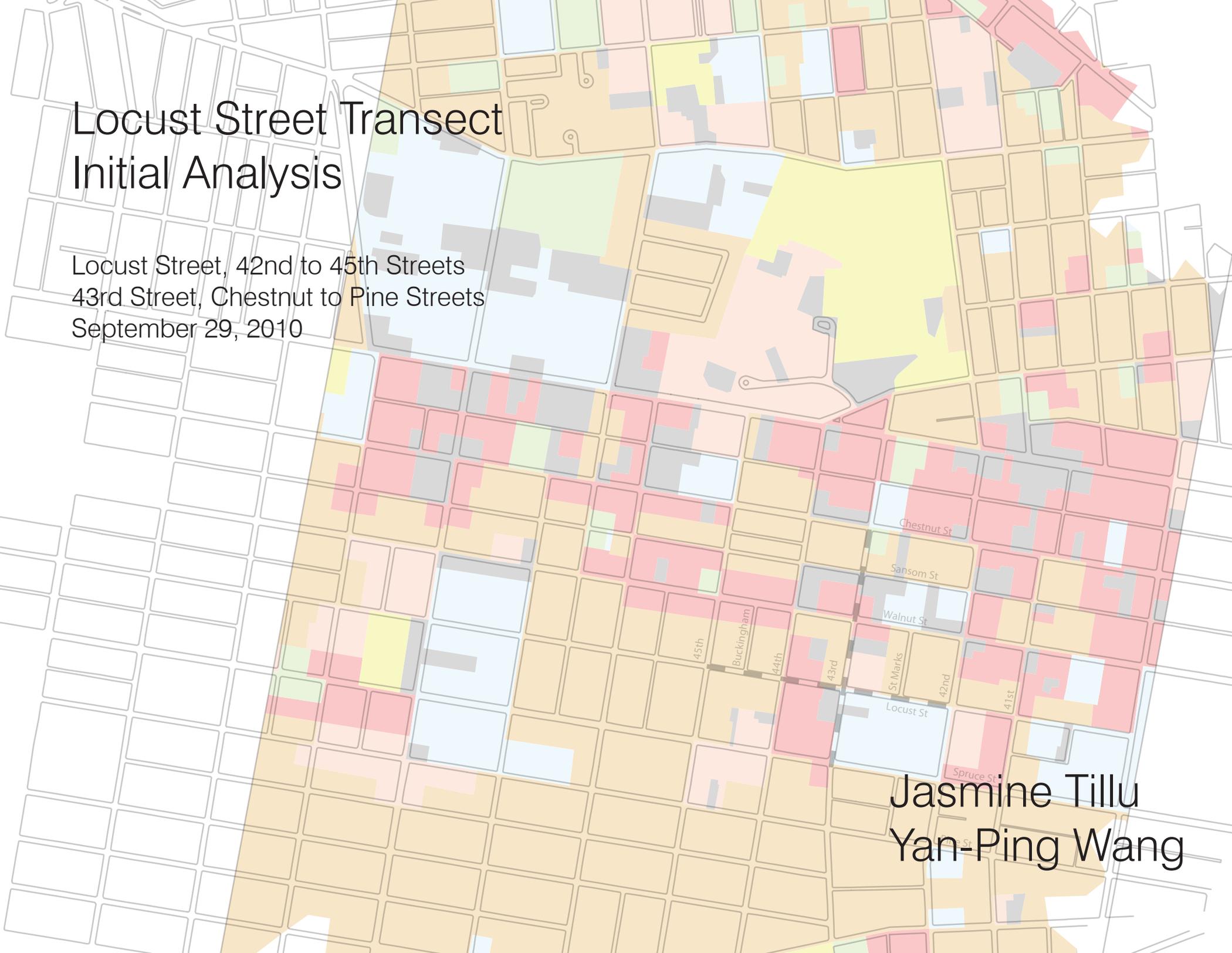


# Locust Street Transect Initial Analysis

Locust Street, 42nd to 45th Streets  
43rd Street, Chestnut to Pine Streets  
September 29, 2010



Jasmine Tillu  
Yan-Ping Wang

## DEMOGRAPHIC PROFILE OF CENSUS TRACT 87

\* Average age of residents is on the younger-side

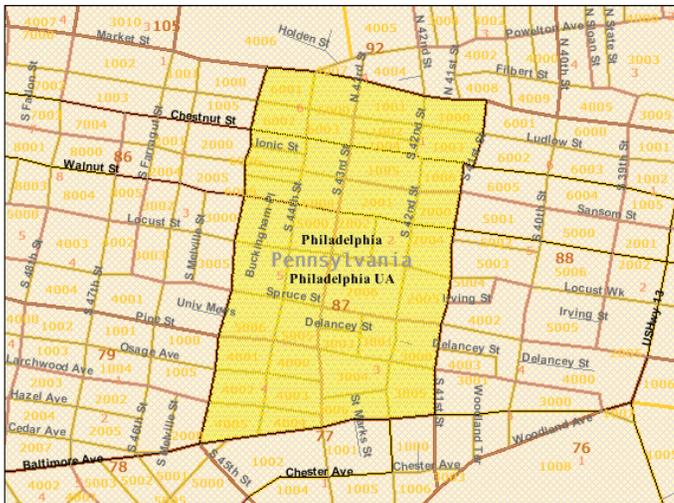
\* Many more renters than homeowners

\* Higher percentage with bachelor's degrees

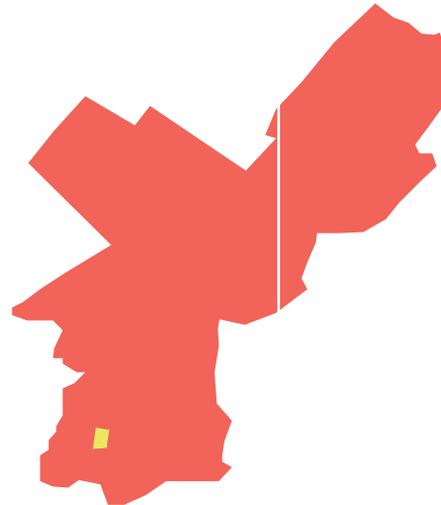
\* Higher population of foreign-born --> younger foreign-born

--> evidence of university students

CENSUS TRACT 87



PHILADELPHIA



PENNSYLVANIA



	Census Tract 87	Philadelphia
<i>Pop. Aged 18-34</i>	64%	24%
<i>Renter occupied</i>	98%	43%
<i>BA degree</i>	27%	12%
<i>Pop. Foreign-born</i>	27%	11%

# LAND USE AND CONTEXT MAP

UNIVERSITY OF PENNSYLVANIA



Chestnut St

Sansom St

Walnut St

45th

Buckingham

44th

43rd

St Marks

42nd

41st

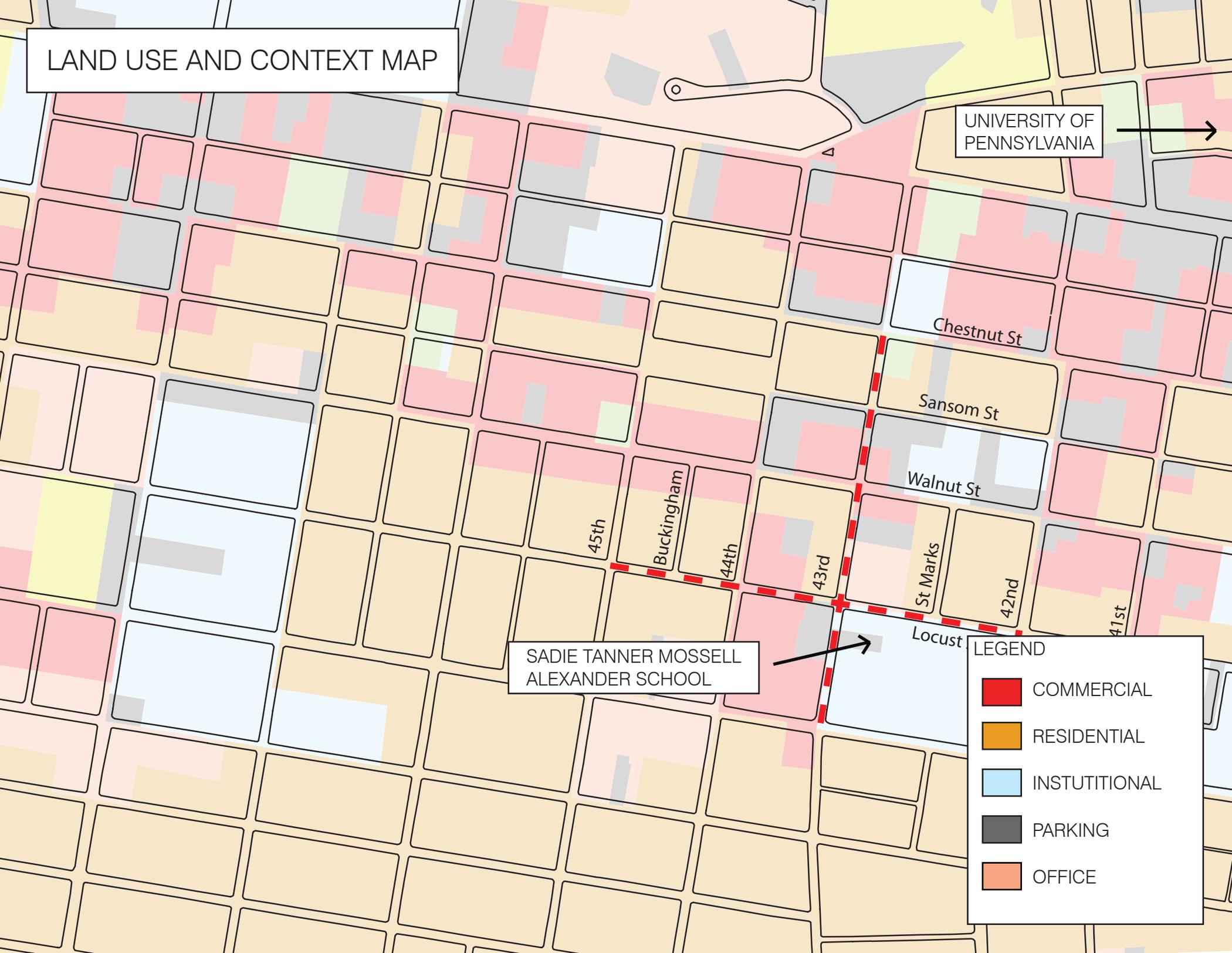
Locust

SADIE TANNER MOSSELL  
ALEXANDER SCHOOL



LEGEND

- COMMERCIAL
- RESIDENTIAL
- INSTUTIONAL
- PARKING
- OFFICE



## SADIE TANNER MOSSELL ALEXANDER SCHOOL

\*Pre-K to 8

\* Partnership between University of Pennsylvania, Philadelphia School District, and Philadelphia Federation of Teachers

\* Self-described “exemplary neighborhood public school” = magnet school

\* University maintenance of lush green space surrounding school

\* Cooperation with the community and the school in developing the grounds for use by students and University City families. Space includes rain garden.

\* Community school that describes itself as one that “draws upon, and contributes to, the vitality of the neighborhood through an innovative community-focused curriculum, and is a vibrant center for educational, recreational, cultural, and social programs for adults and children in the community.”

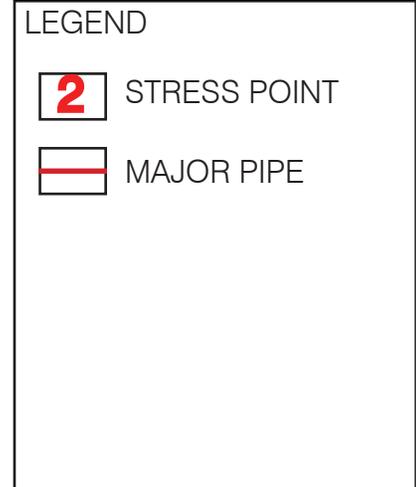
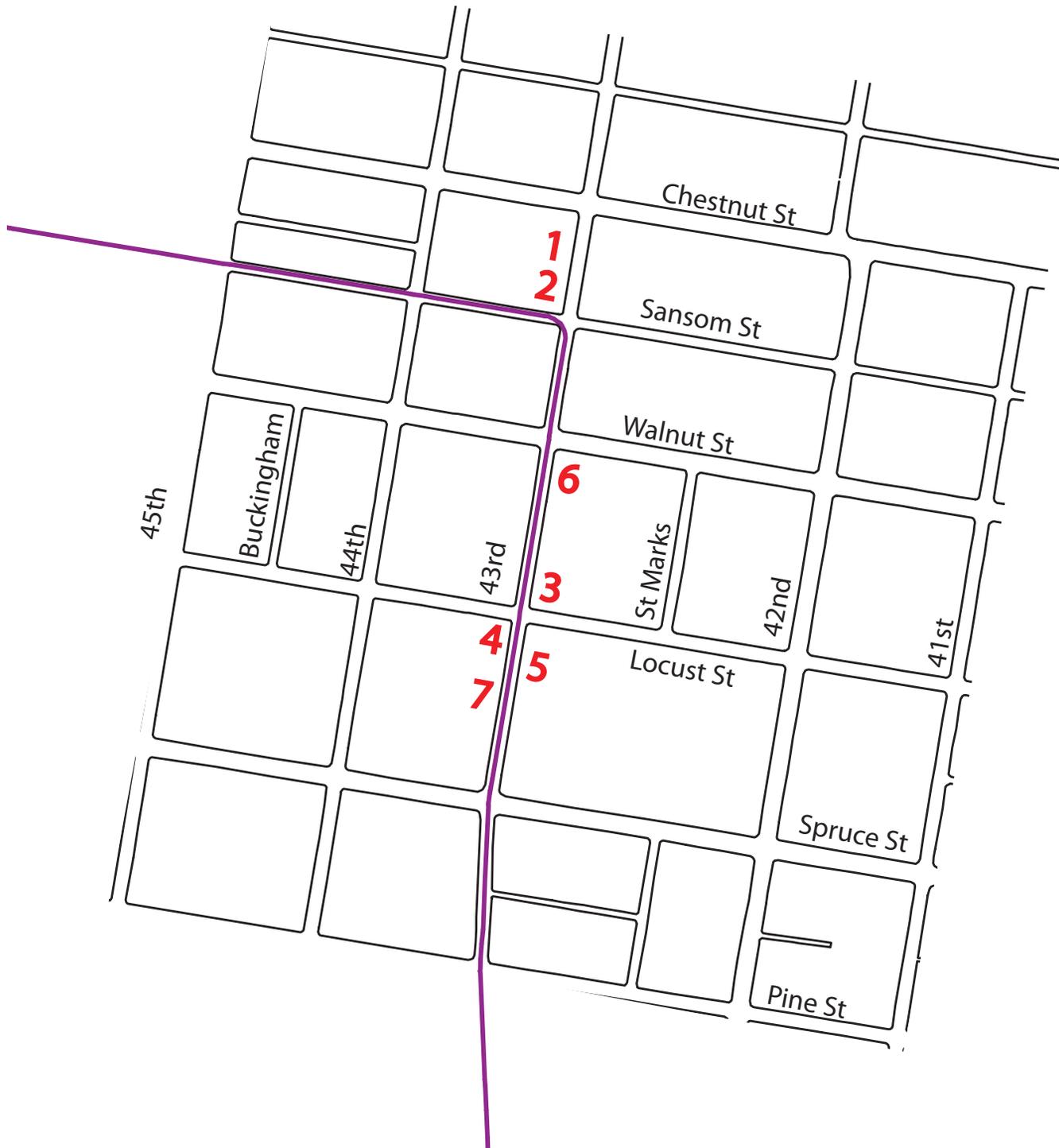
\* Point of water convergence



## IDENTIFYING EVIDENCE OF CURRENT STRESSES AND PREVIOUS CAVE INS:

A portion of a major gravity-fed sewer line runs through our transect, eventually flowing into the treatment plant by the Schuylkill River.

Our transect has a history of cave-ins, and we were able to visually identify a few of these areas.





VISUAL EVIDENCE FROM STREETVIEW:

Sagging or cracking pavement

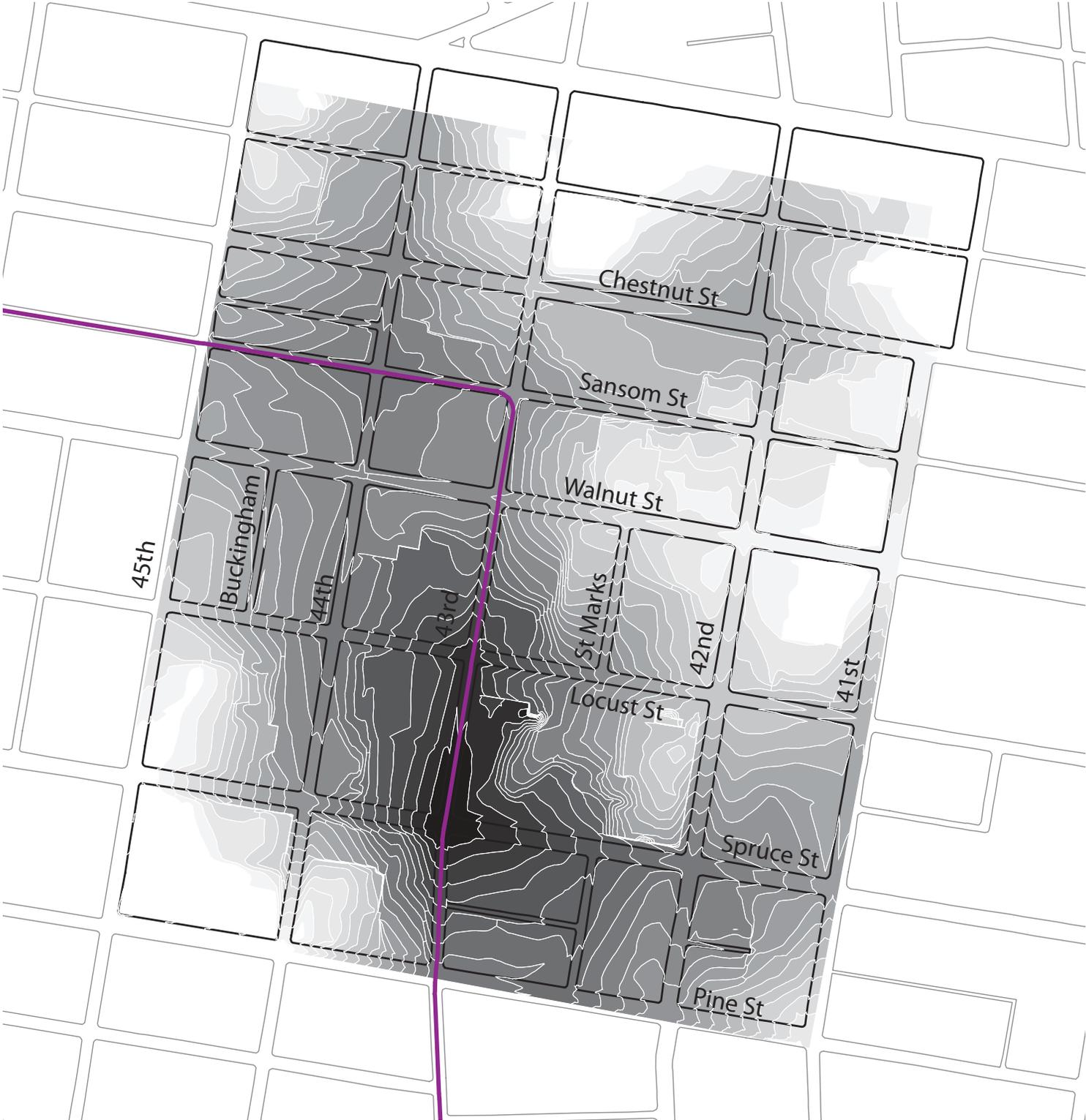
Evidence of re-patched or reinforced paving

Sloping sidewalks



SITE TOPOGRAPHY: 2 FOOT  
CONTOURS

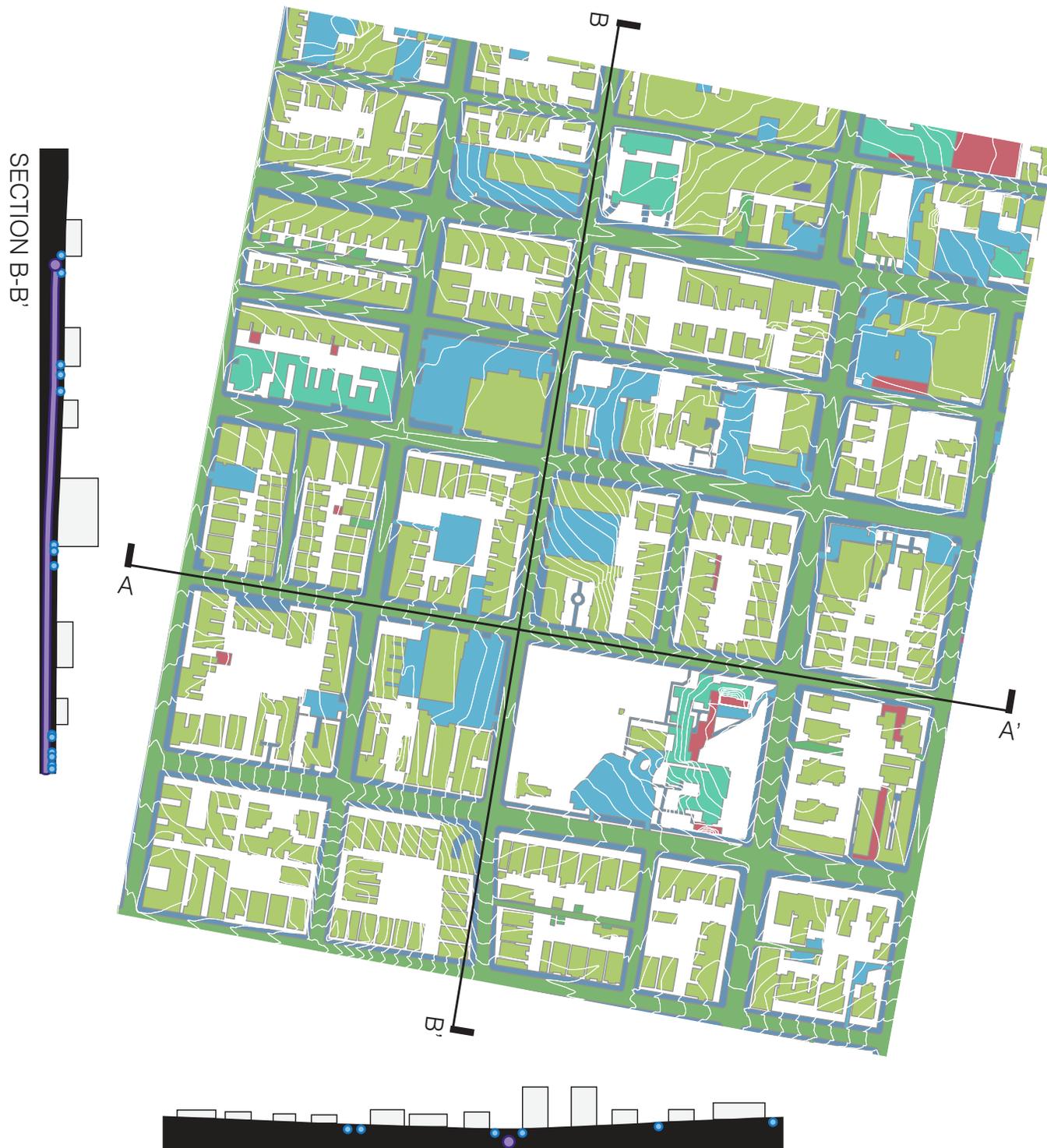
Two relative low points in the  
immediate area that coincide  
with the major sewer main



LEGEND

-  HIGH
-  LOW
-  MAJOR PIPE

# IMPERVIOUS COVER BREAKDOWN



SECTION A-A'

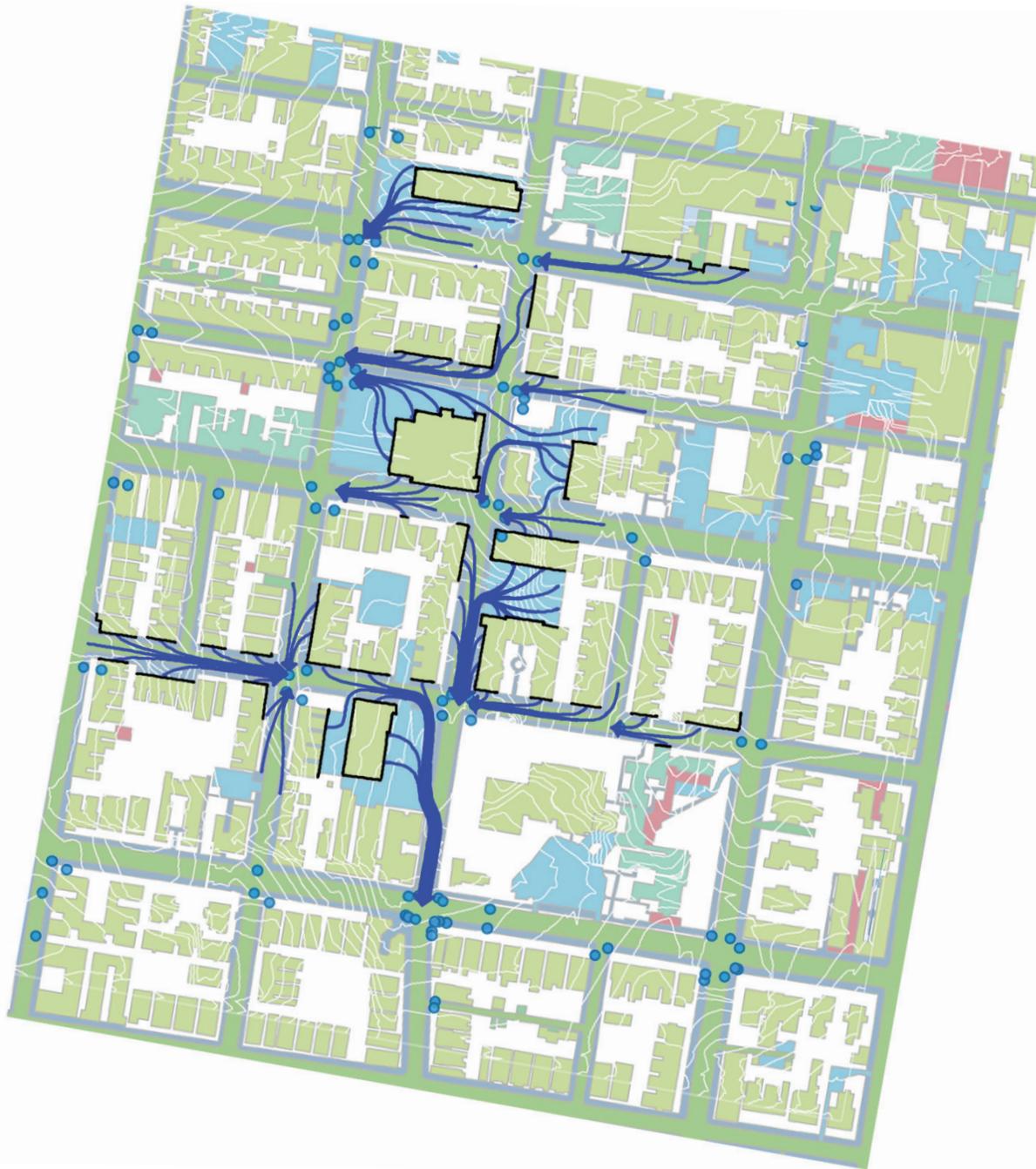
## IMPERVIOUS COVER BREAKDOWN

### SURFACE FLOW:

Tracking water from rooftops  
and impervious surfaces into  
the nearest inlet

Assume no surface flow  
crosses pervious surfaces

SECTION B-B'



### LEGEND

-  PARKING LOT
-  ROOFTOP
-  STREET
-  OLD STRUCTURE
-  PERVIOUS

SECTION A-A'



## IMPERVIOUS COVER BREAKDOWN

### SURFACE FLOW:

Tracking water from rooftops and impervious surfaces into the nearest inlet

Assume no surface flow crosses pervious surfaces

### PIPE FLOW:

Aggregating the relative amounts of surface flow in order to diagram the stresses in the main pipeline

Two major “jumps”

SECTION B-B'



SECTION A-A'



## LEGEND

-  PARKING LOT
-  ROOFTOP
-  STREET
-  OLD STRUCTURE
-  PERVIOUS

## IMPERVIOUS COVER BREAKDOWN

### SURFACE FLOW:

Tracking water from rooftops and impervious surfaces into the nearest inlet

Assume no surface flow crosses pervious surfaces

### PIPE FLOW:

Aggregating the relative amounts of surface flow in order to diagram the stresses in the main pipeline

Two major “jumps”

### FLOW + CIRCULATION:

Convergence of foot traffic and stormwater around the school / pervious surface

SECTION B-B'



SECTION A-A'

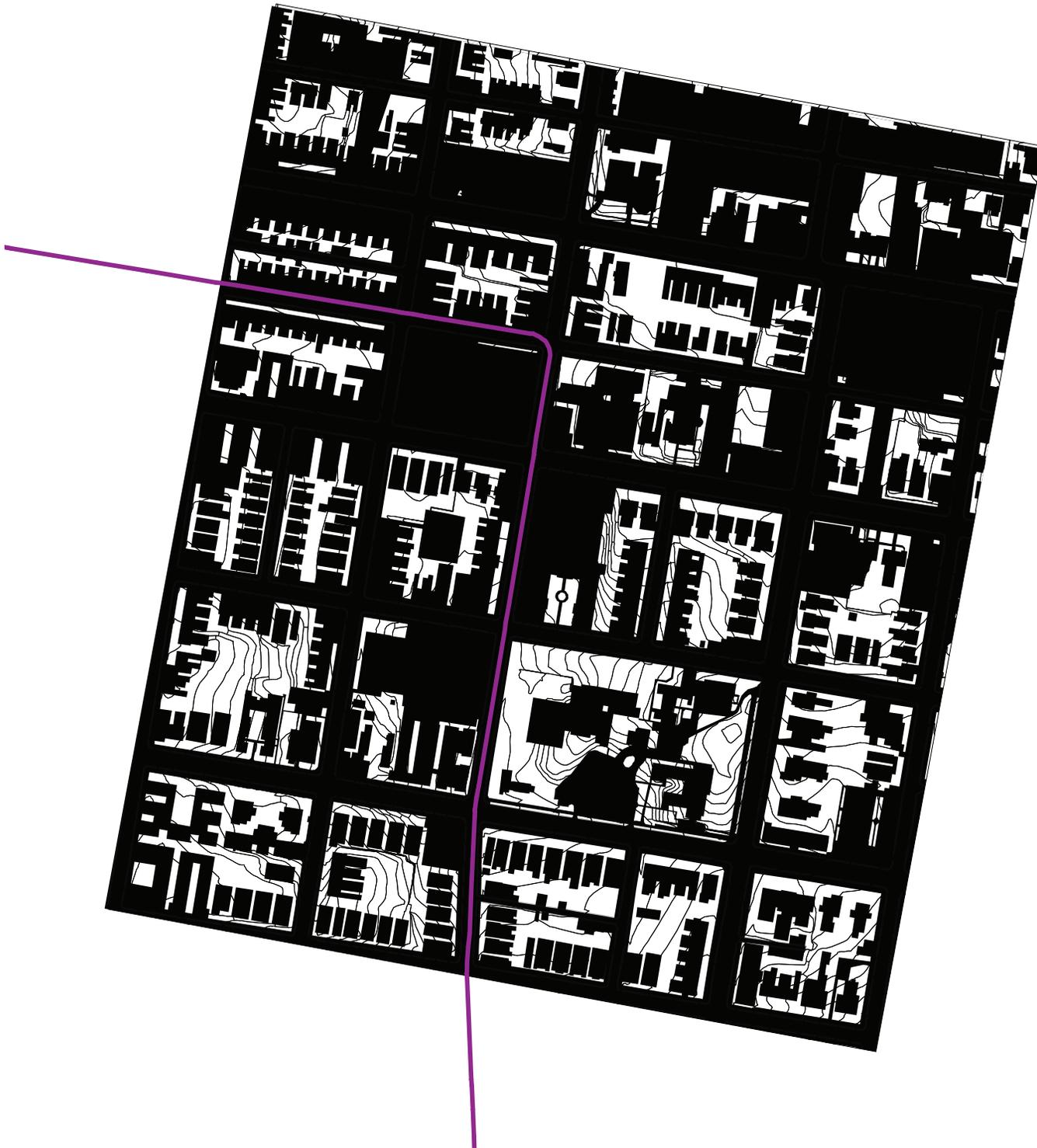


## LEGEND

-  PARKING LOT
-  ROOFTOP
-  STREET
-  OLD STRUCTURE
-  PERVIOUS

PERVIOUS COVER:

Notice the particularly large area of pervious cover surrounding the school area



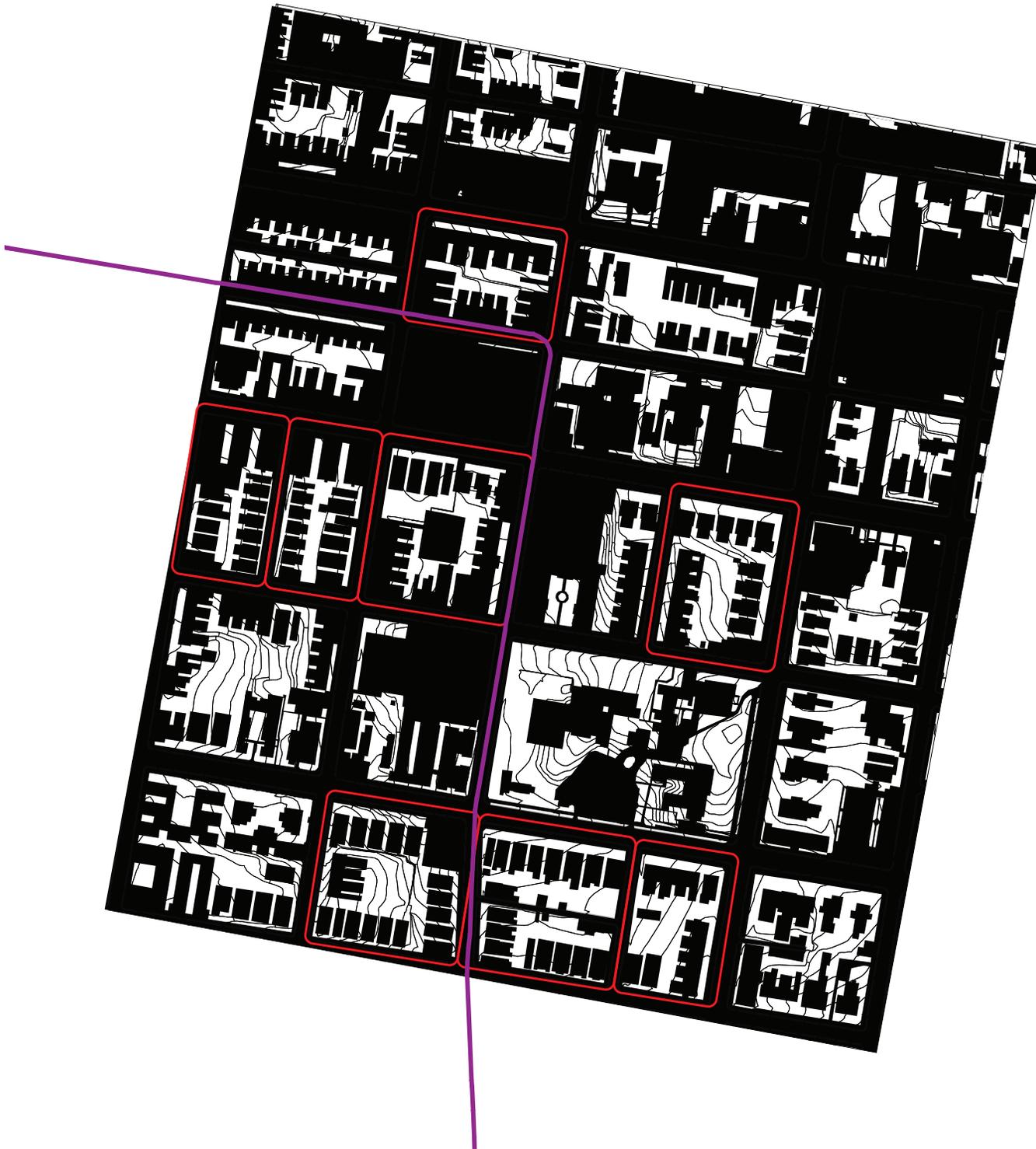
LEGEND

- PERVIOUS
- IMPERVIOUS

## PERVIOUS COVER:

Notice the particularly large area of pervious cover surrounding the school area

Our surface flow study showed certain block types that allowed less water to flow into the sewer main.



### LEGEND

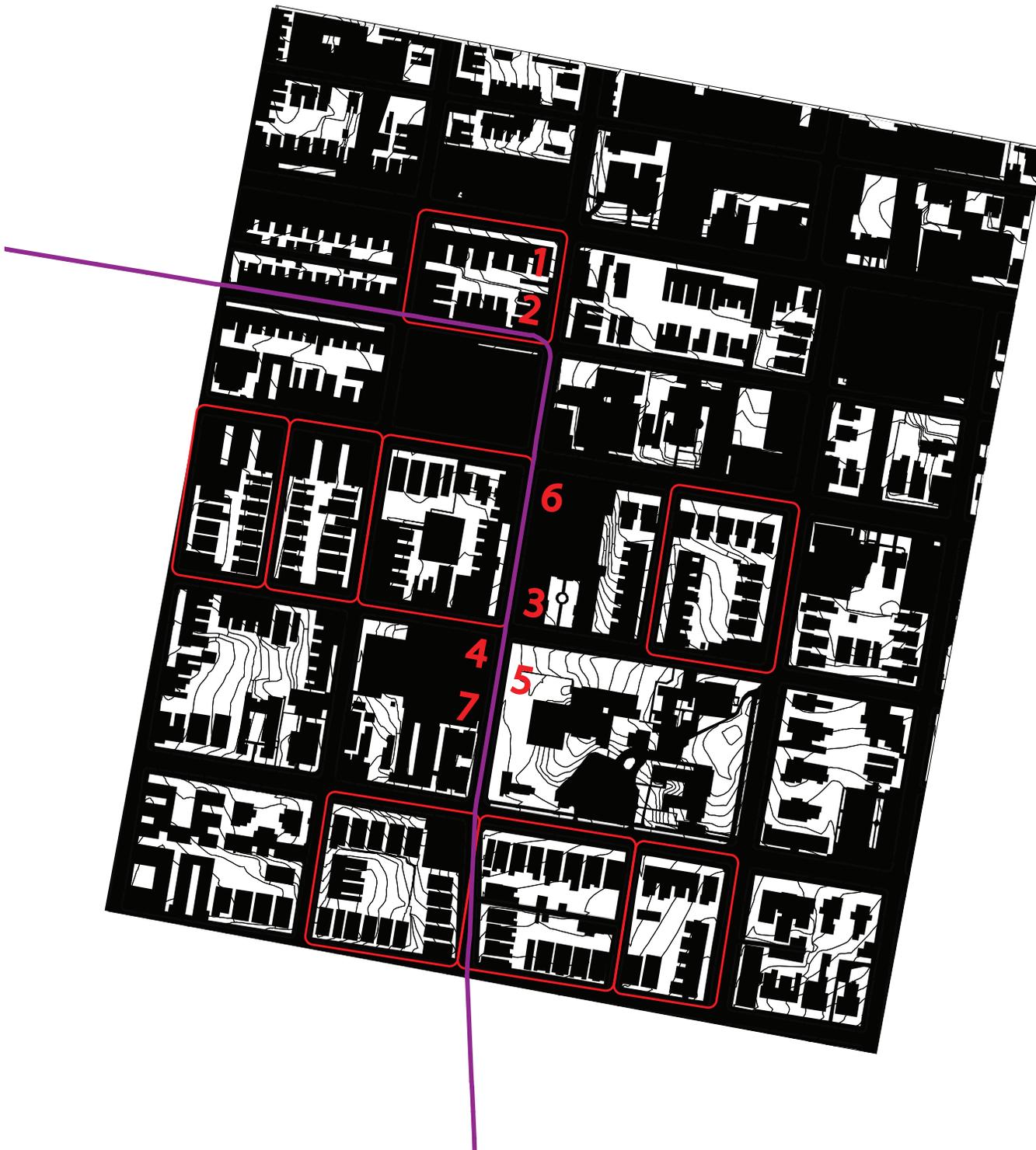
-  PERVIOUS
-  IMPERVIOUS
-  SINGLE FAMILY HOME BLOCK TYPE

## PERVIOUS COVER:

Notice the particularly large area of pervious cover surrounding the school area

Our surface flow study showed certain block types that allowed less water to flow into the sewer main.

However, these block types were also adjacent to the observed stress points.



### LEGEND

-  PERVIOUS
-  IMPERVIOUS
-  SINGLE FAMILY HOME BLOCK TYPE
-  STRESS POINT

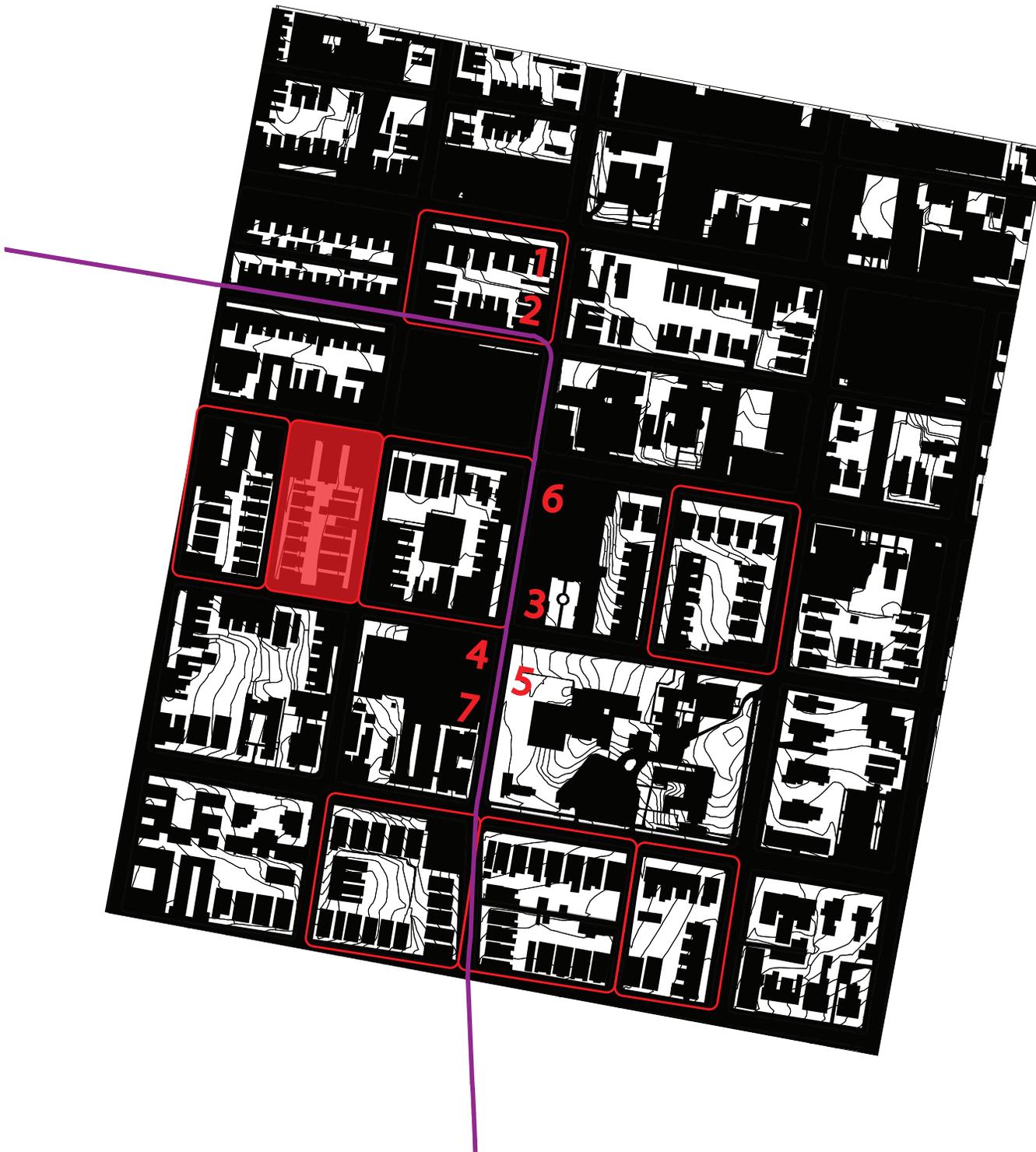
## PERVIOUS COVER:

Notice the particularly large area of pervious cover surrounding the school area

Our surface flow study showed certain block types that allowed less water to flow into the sewer main.

However, these block types were also adjacent to the observed stress points.

Zooming in to look at one of these blocks...



## LEGEND

-  PERVIOUS
-  IMPERVIOUS
-  SINGLE FAMILY HOME BLOCK TYPE
-  STRESS POINT

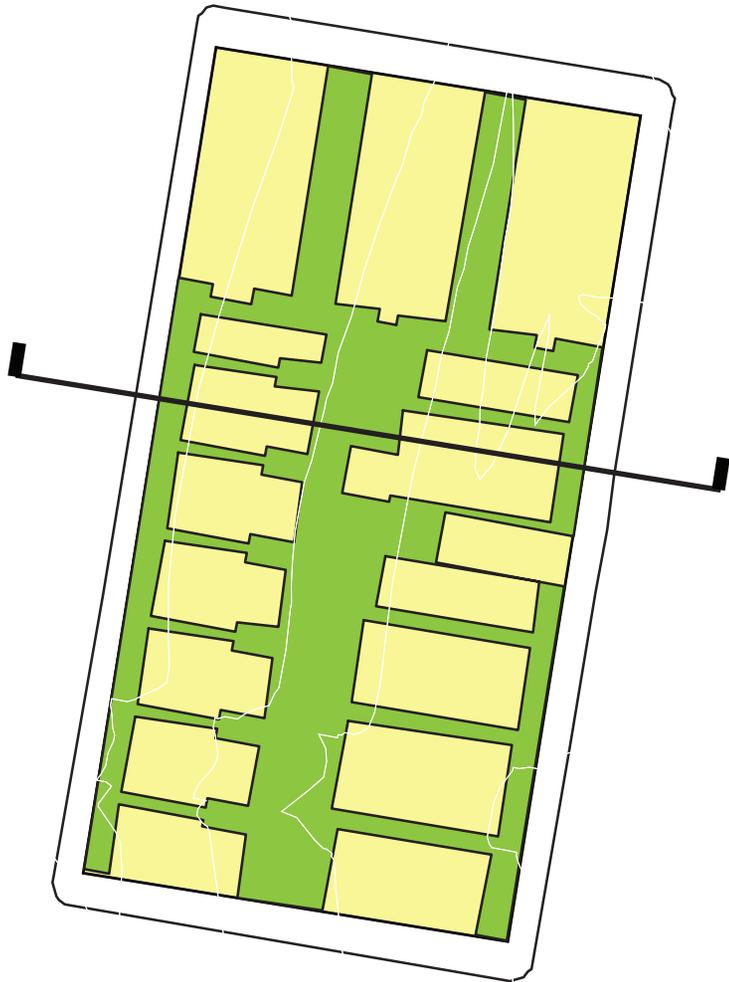
# SAMPLE BLOCK TYPE STUDY

\* Common housing typology  
- single family residential homes (including row houses)

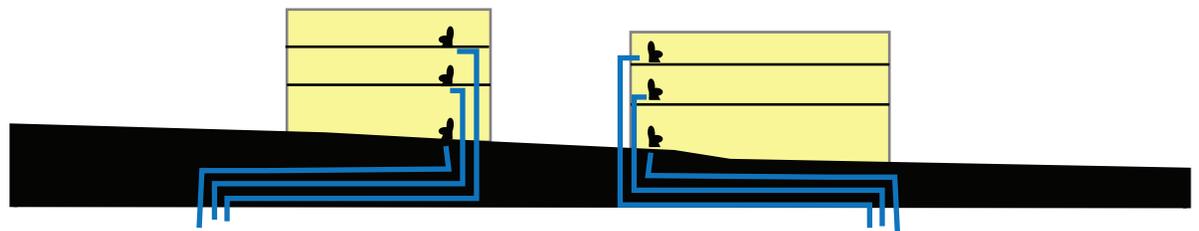
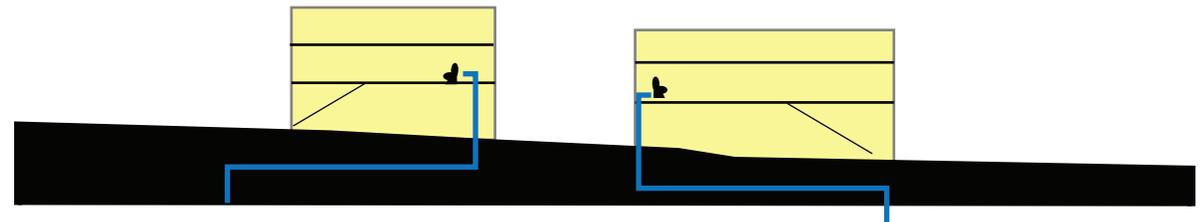
\* Originally meant for one family, though because of demand for rentals in area, owners have split homes into several apartments

-->

This means that more people are in the house than accommodated for --> More water usage --> greater water flow --> More stress on pipes



N  
↑

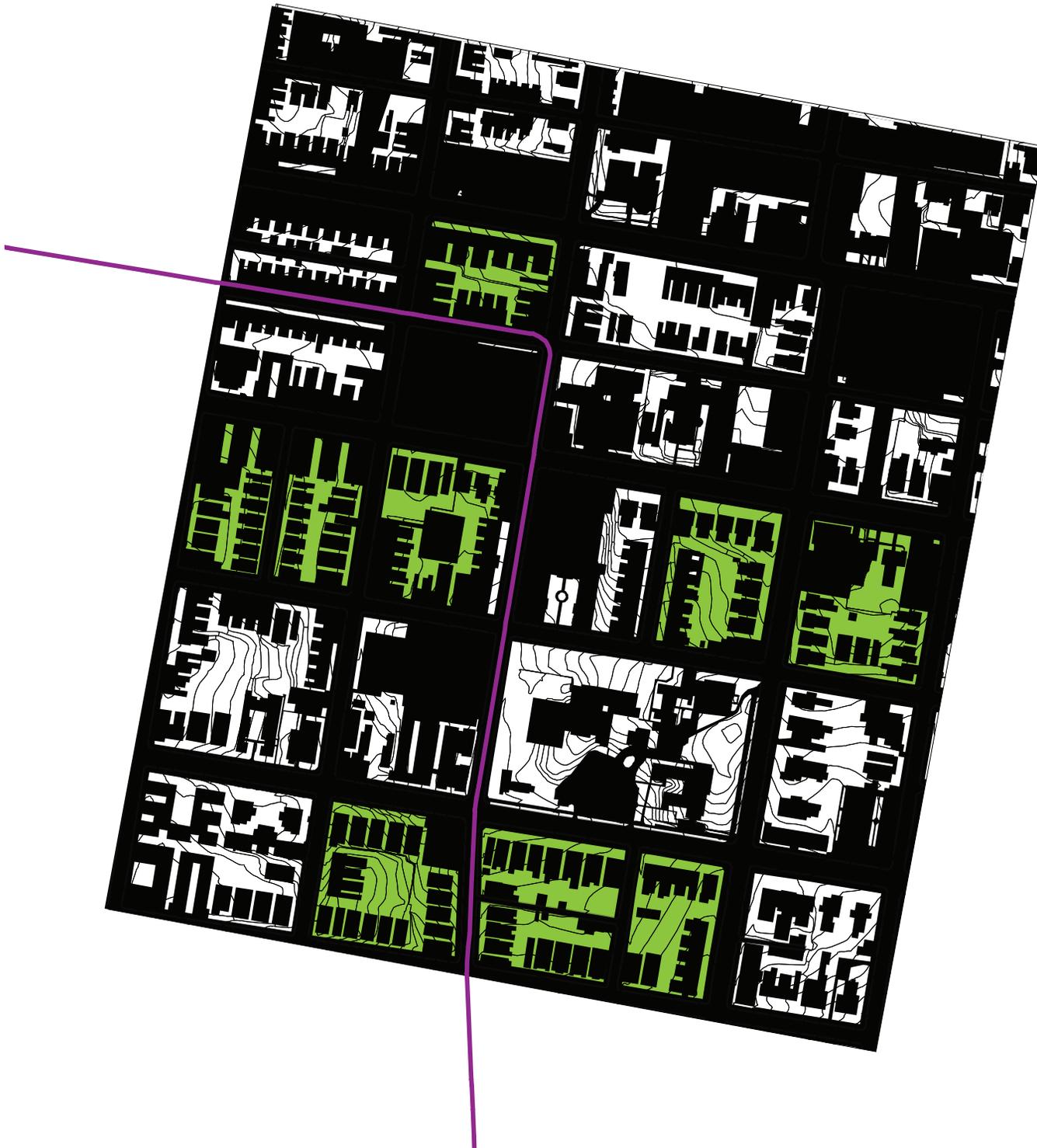


1":80'

## OPPORTUNITY SITES:

We suspect these block types to be stressing the sewer beyond design capacity, and there is also an effective arrangement of pervious surface.

We do not know how well the existing pervious surface is performing, but they offer opportunity sites where the dirt can be aerated, plants planted, swales installed, etc.



### LEGEND

 OPPORTUNITY SITE