

Real Streets:

Designing, Getting, and Keeping Them



CNU XII

Walter Kulash, P.E.

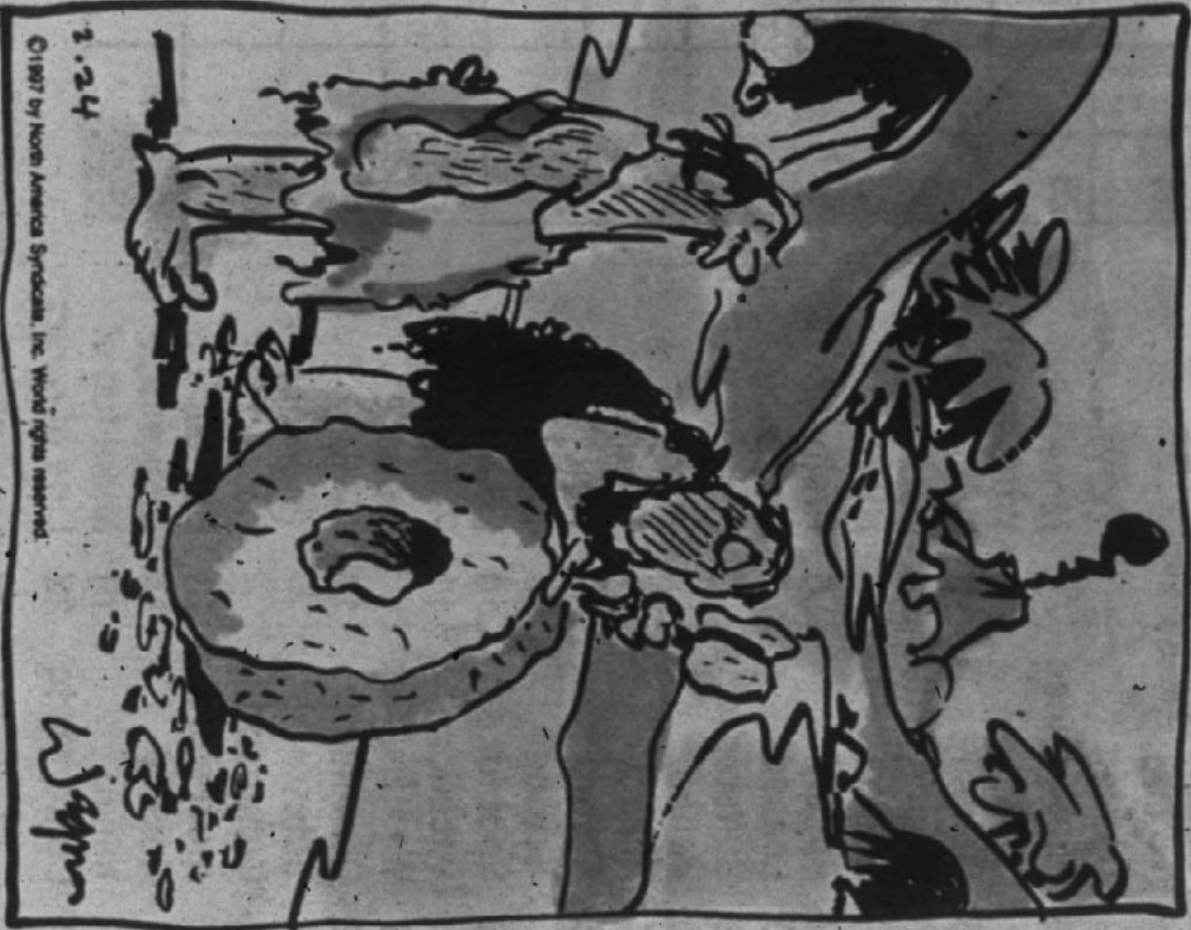
Glatting Jackson

2004

Graphics: Paula B. Tomala

Grin & Bear It

By Fred Wagner



1.24

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Wagner

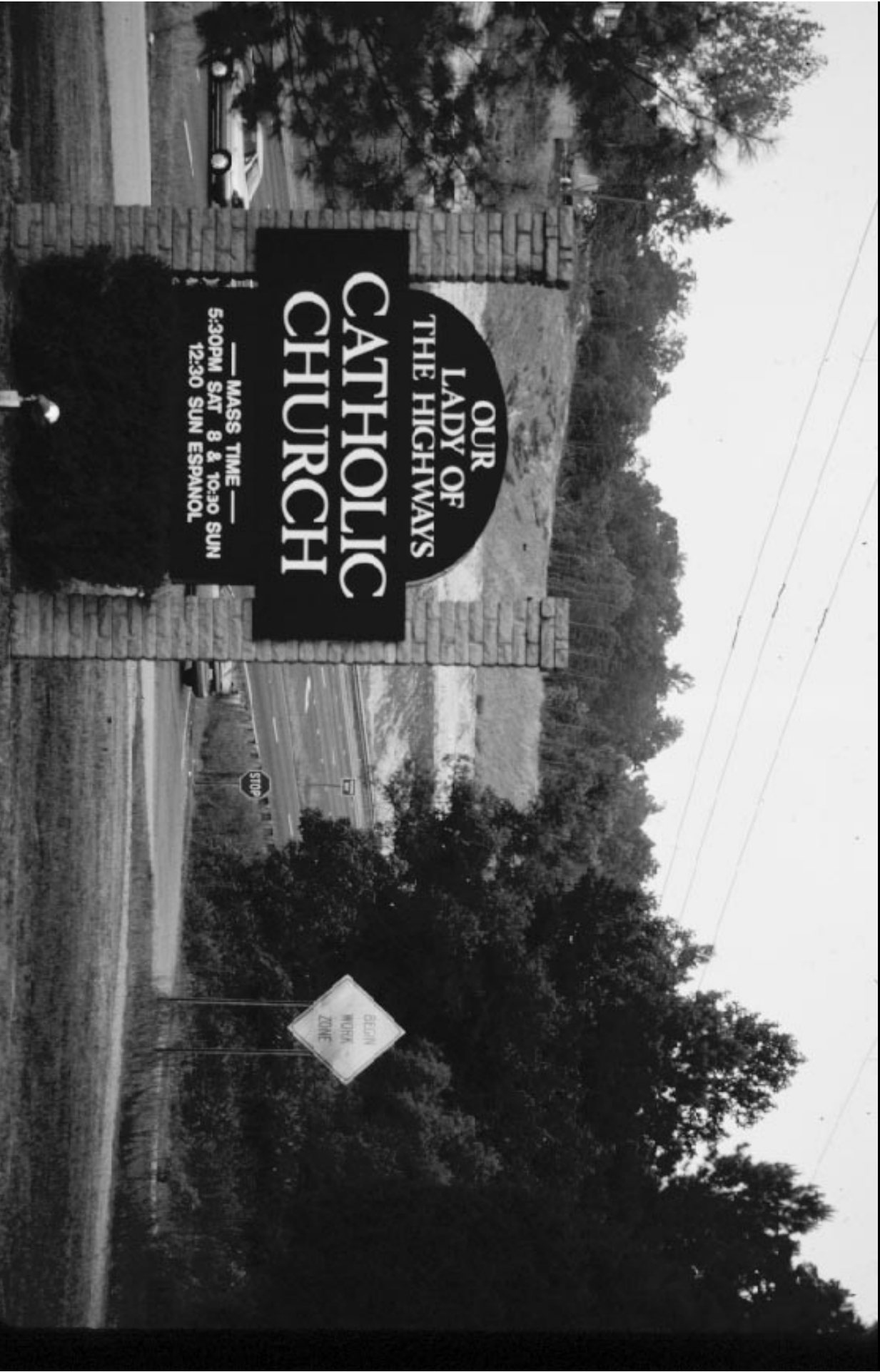
"We're gonna need roads...lots of 'em!"

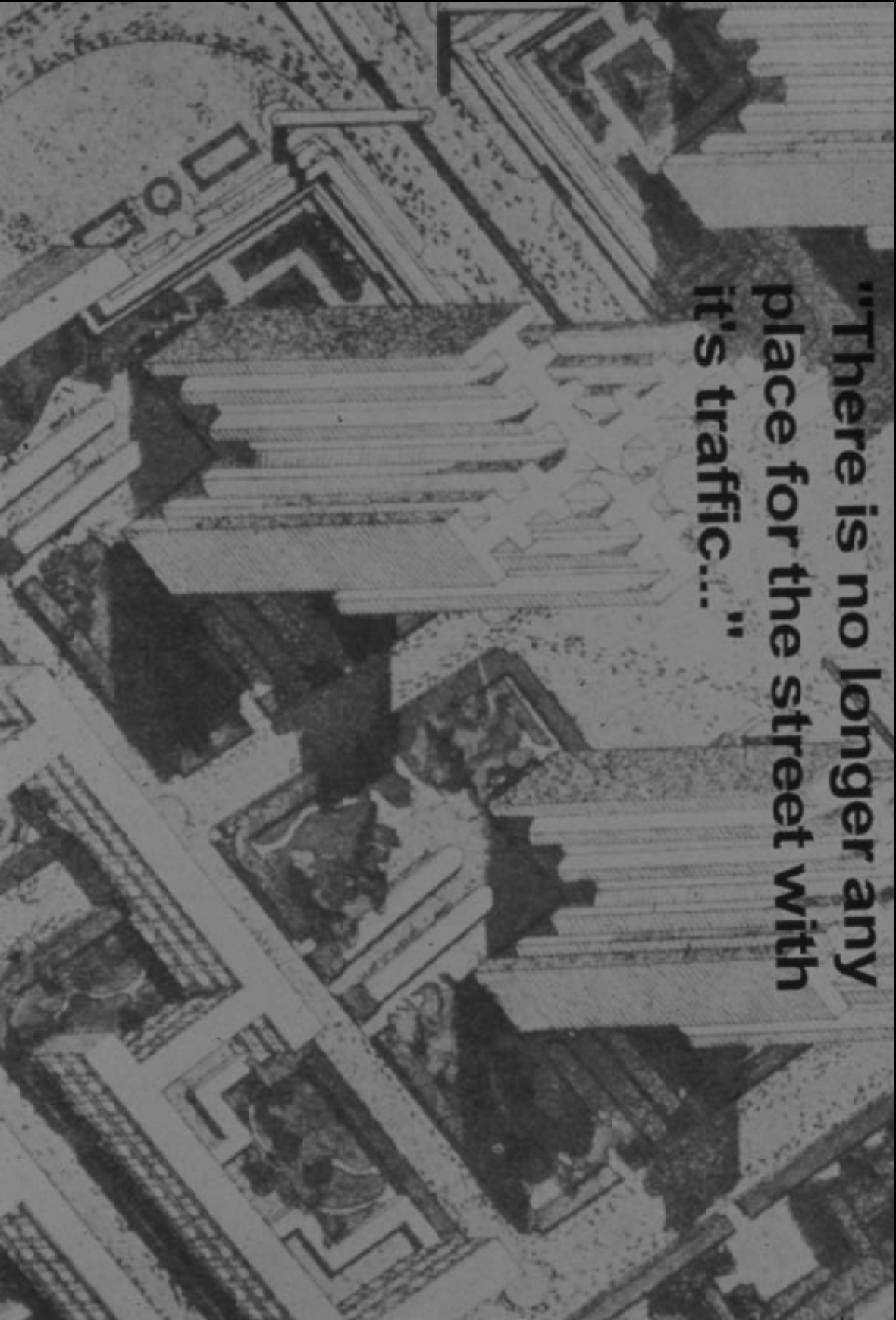
OUR
LADY OF
THE HIGHWAYS
CATHOLIC
CHURCH

— MASS TIME —
5:30PM SAT 8 & 10:30 SUN
12:30 SUN ESPANOL

BECAUSE
MORRIS
ZONE

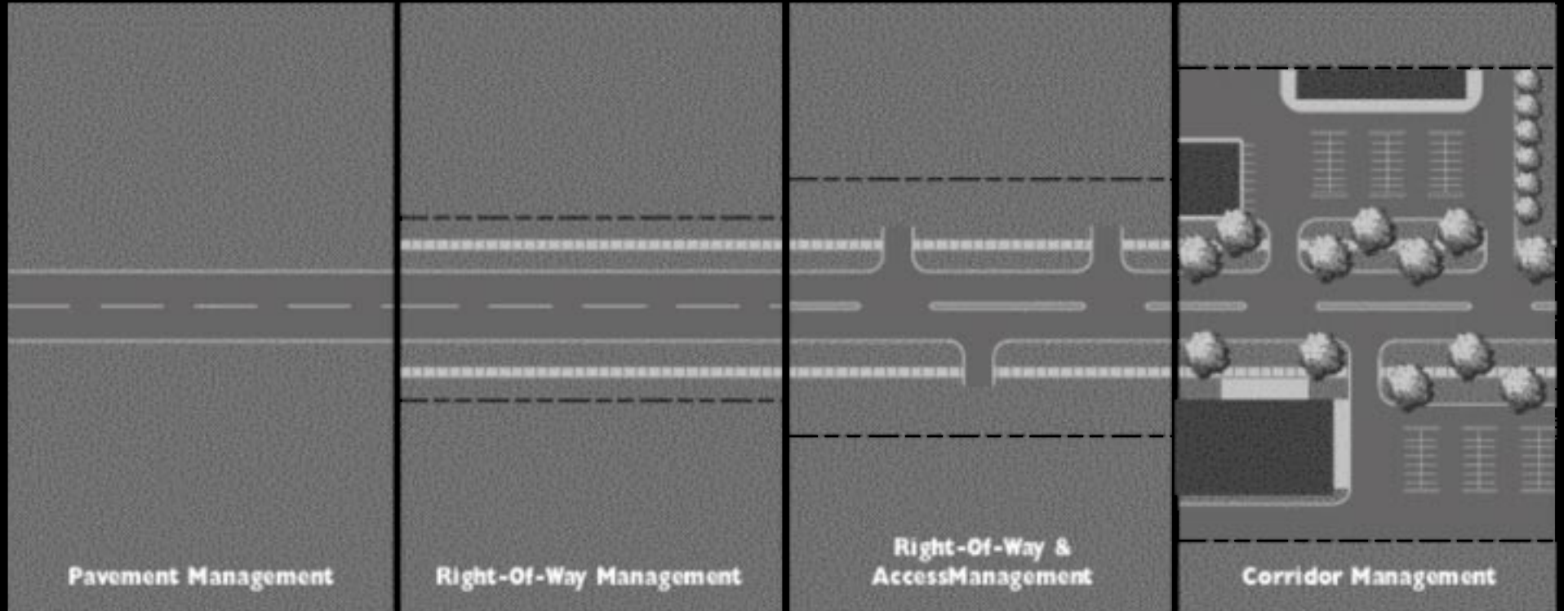
STOP



An aerial, black and white photograph of a dense urban street grid. The streets are closely spaced and form a complex pattern of rectangles and squares. The buildings are tall and closely packed, creating a textured, almost abstract pattern of light and dark. The overall impression is one of a very compact and busy city center.

**"There is no longer any
place for the street with
it's traffic..."**

Evolution of Corridor Management



Great Streets



Developed by Steve Price
in association w/ Dover Kohl & Partners
& Glatting Jackson
for Johnson City Tennessee

Walnut Street: Before & After?

Transportation Principles



No Impact on Capacity

Developed by Steve Price
in association w/ Dover Kohl & Partners
& Glatting Jackson
for Johnson City Tennessee

Transportation Principles



No Impact on Capacity

Developed by Steve Price
in association w/ Dover Kohl & Partners
& Glatting Jackson
for Johnson City Tennessee

Design Process

Establish Controls

Context

Functional Class

Traffic Service

(Design Speed?)

then

Fit Elements

Cross Section

- Design Speed
- Drainage
- Parking
- Sidewalks
- Bikes
- Trees
- Lights

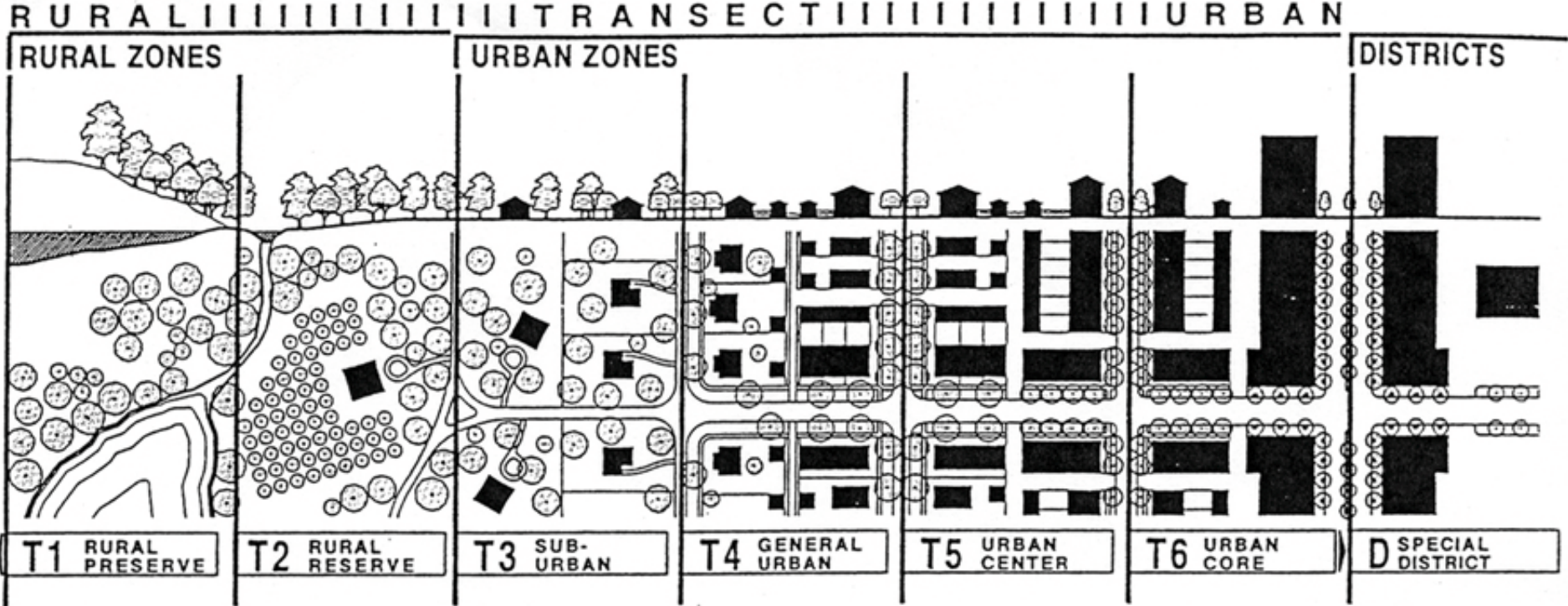
Frontage

- Building Siting
- Off-Street Parking

Network

- Street Spacing
- Street Access

Rural-to-Urban Transect



Transect Points



Urban Activity Center



Village Center



Neighborhood Center



Neighborhood



Industrial

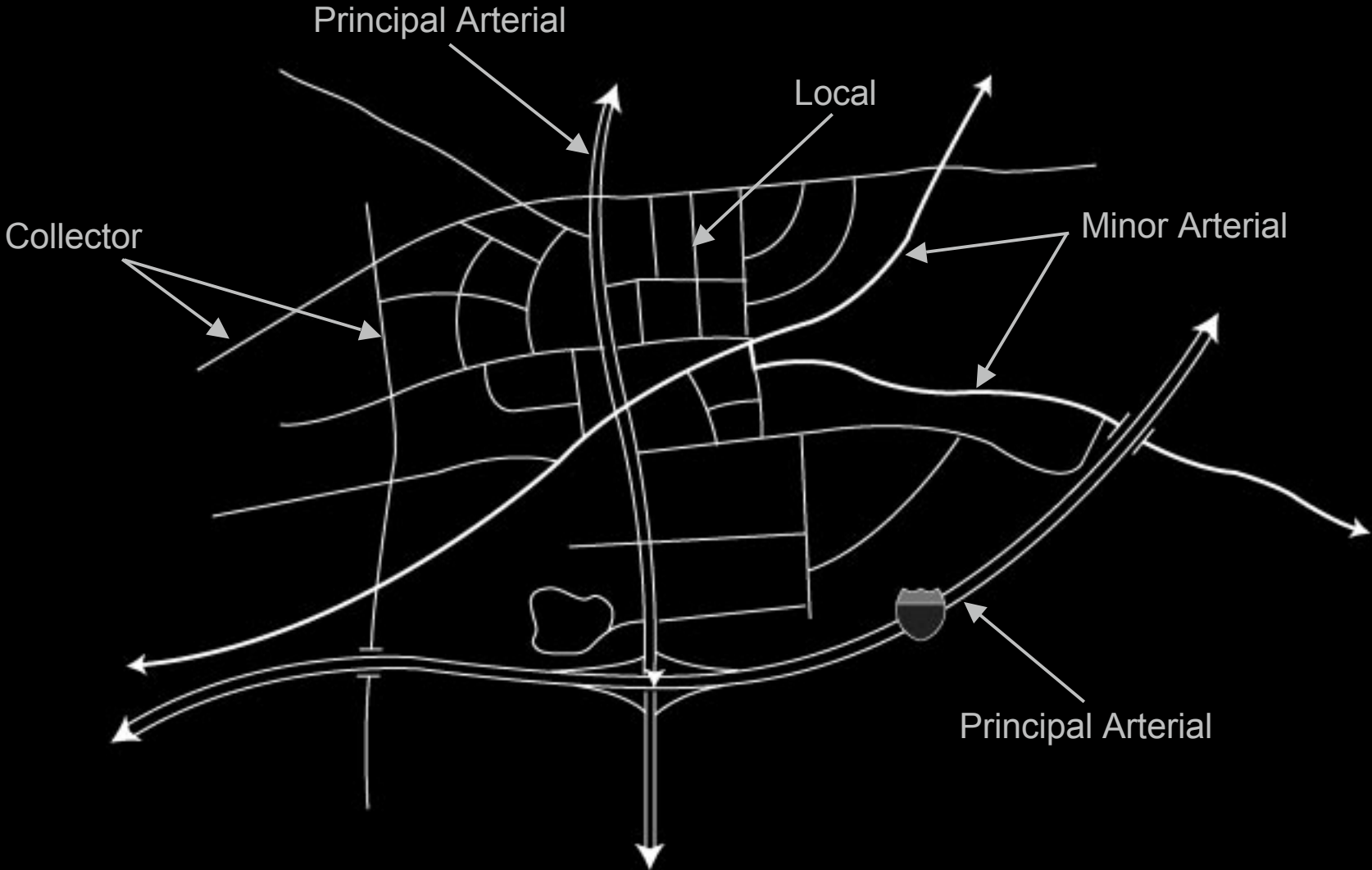


Rural Cluster



Rural Agricultural Area

Functional Classification



Functional Class: Intuitive, Popular



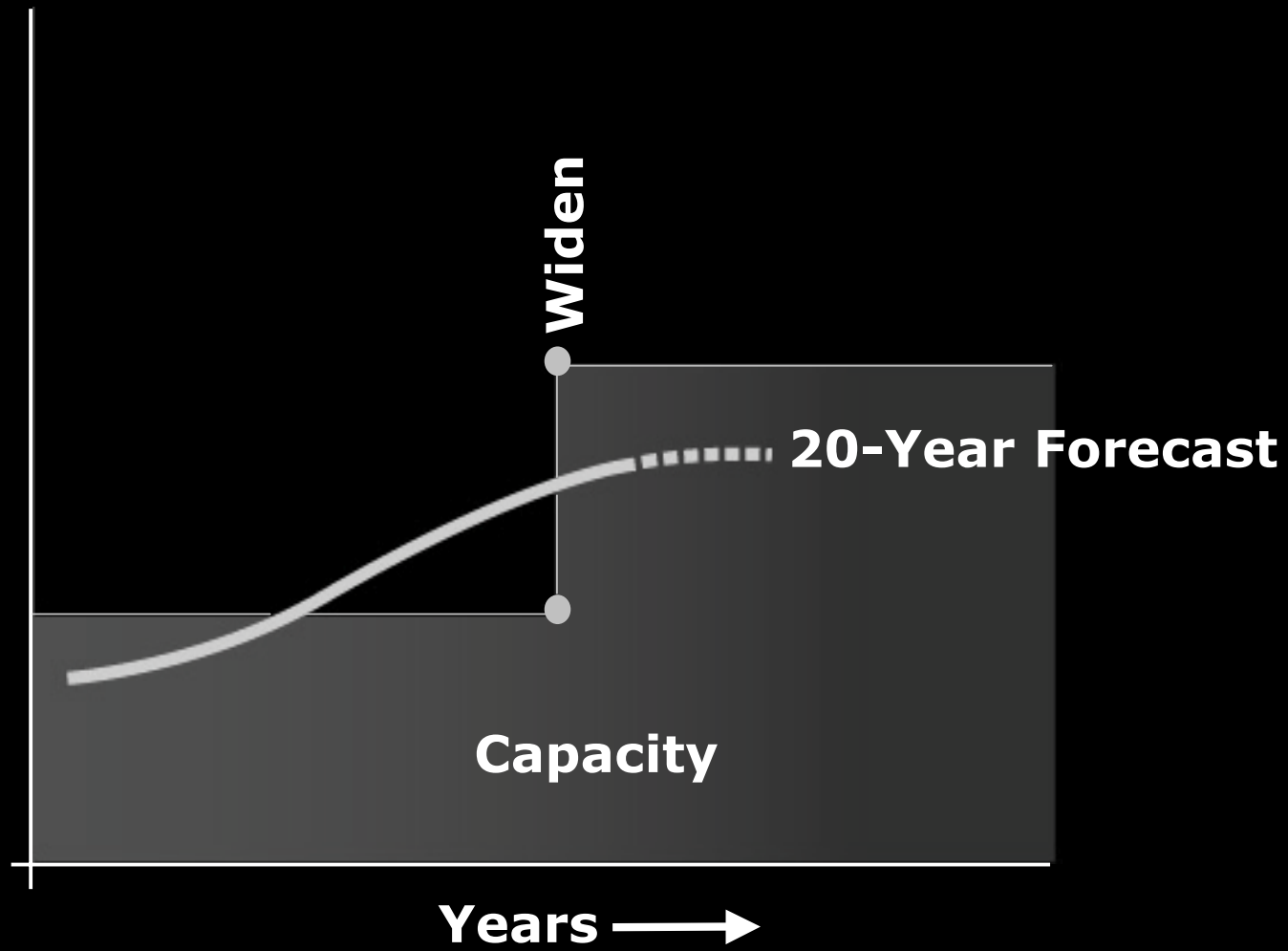
Functional Classification



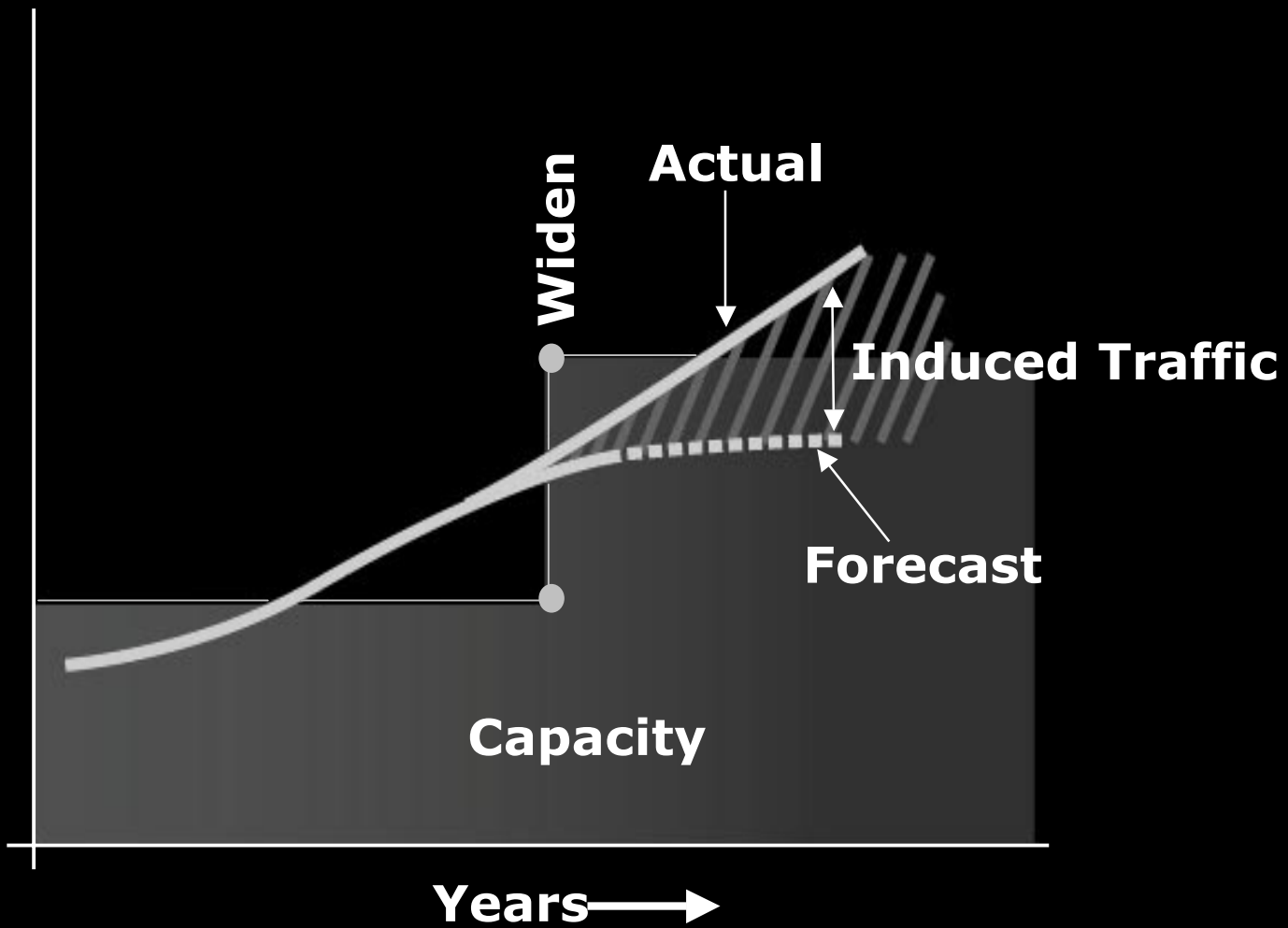
Legend

- | | |
|-----------------------|----------------------|
| Urban Activity Center | Arterial |
| Industrial | Collectors |
| Village Center | Main Streets |
| Neighborhood Center | Neighborhood Streets |
| Neighborhood | Farm-to-Market Roads |
| Rural Cluster | |
| Rural Agricultural | |

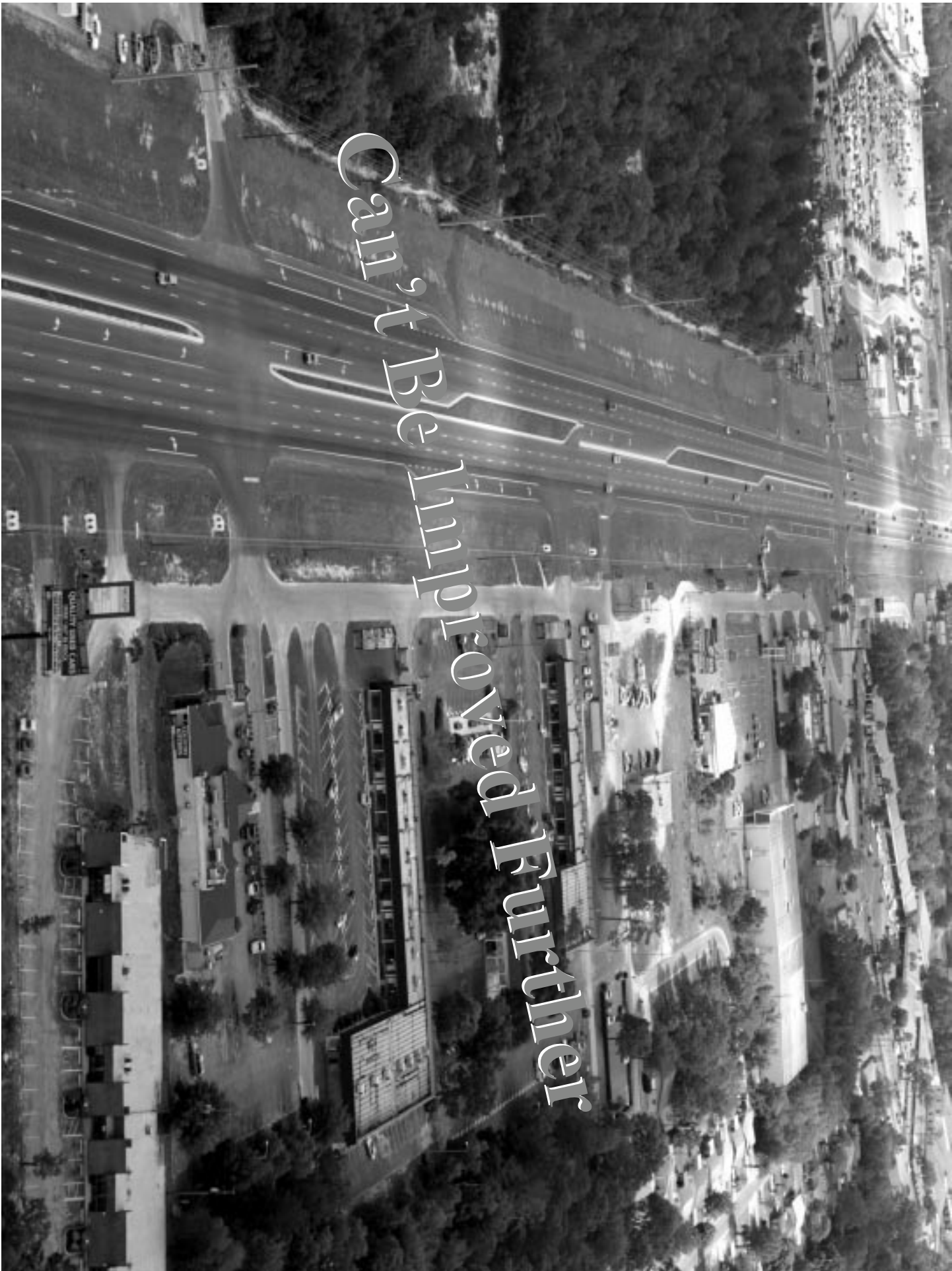
Ideal Traffic Planning



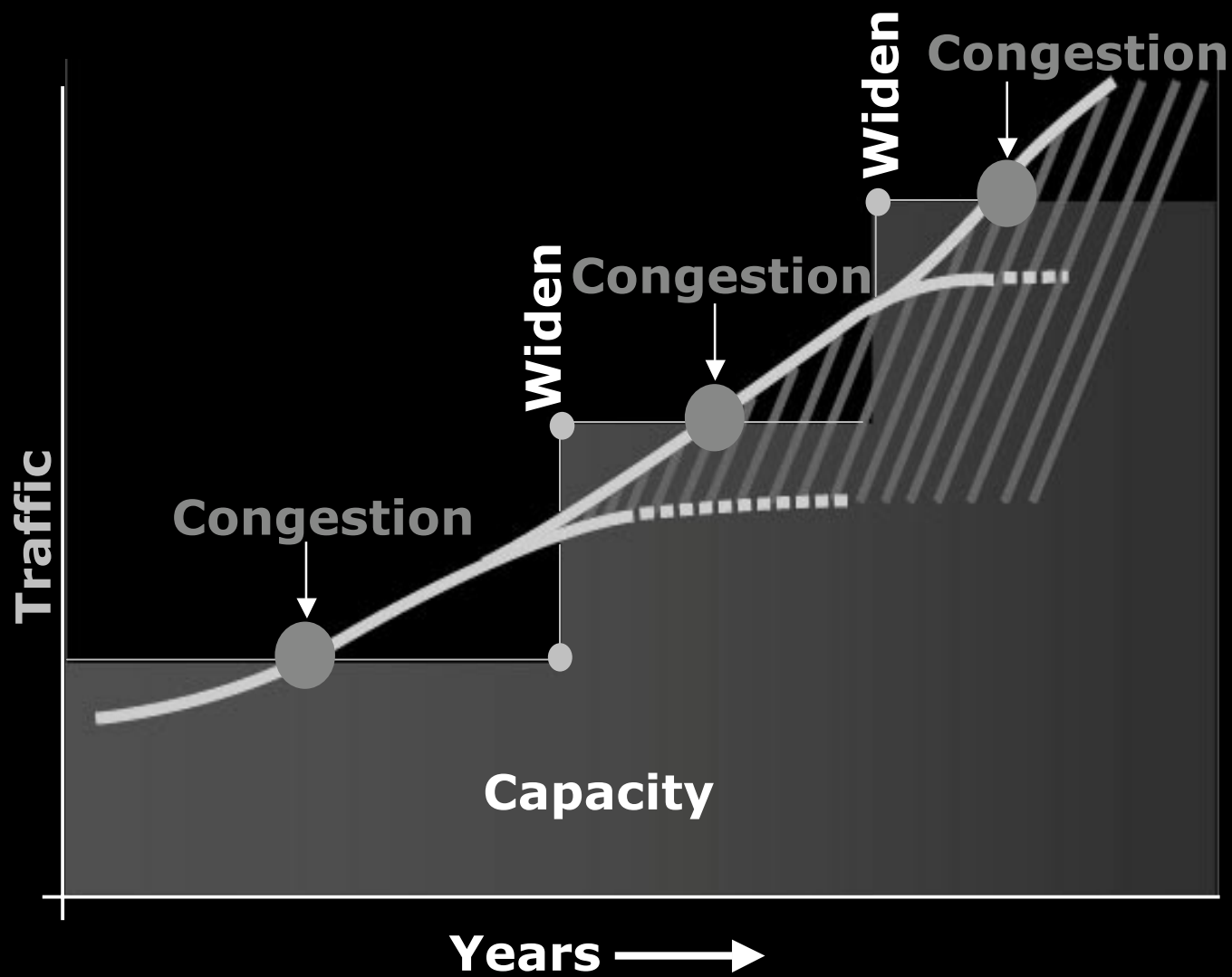
Traffic Planning: The Reality



Can't Be Improved Further



Road Size, Not Congestion is the Choice



**“Trying to cure traffic
congestion with more
capacity is like trying to
cure obesity by
loosening your belt”**

- Glen Heimstra, Futurist

Cross-Section Elements

Drainage

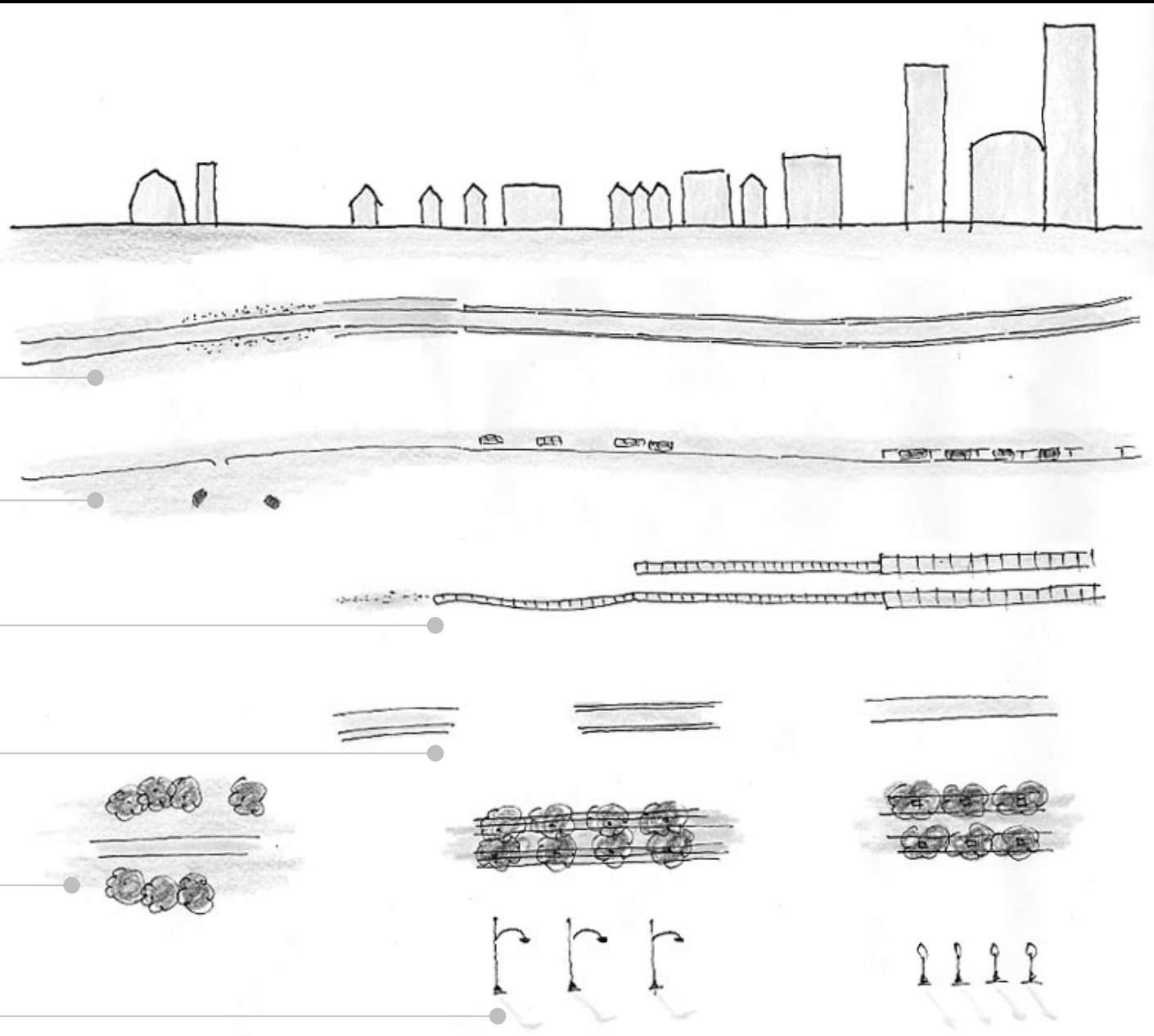
Parking

Sidewalk

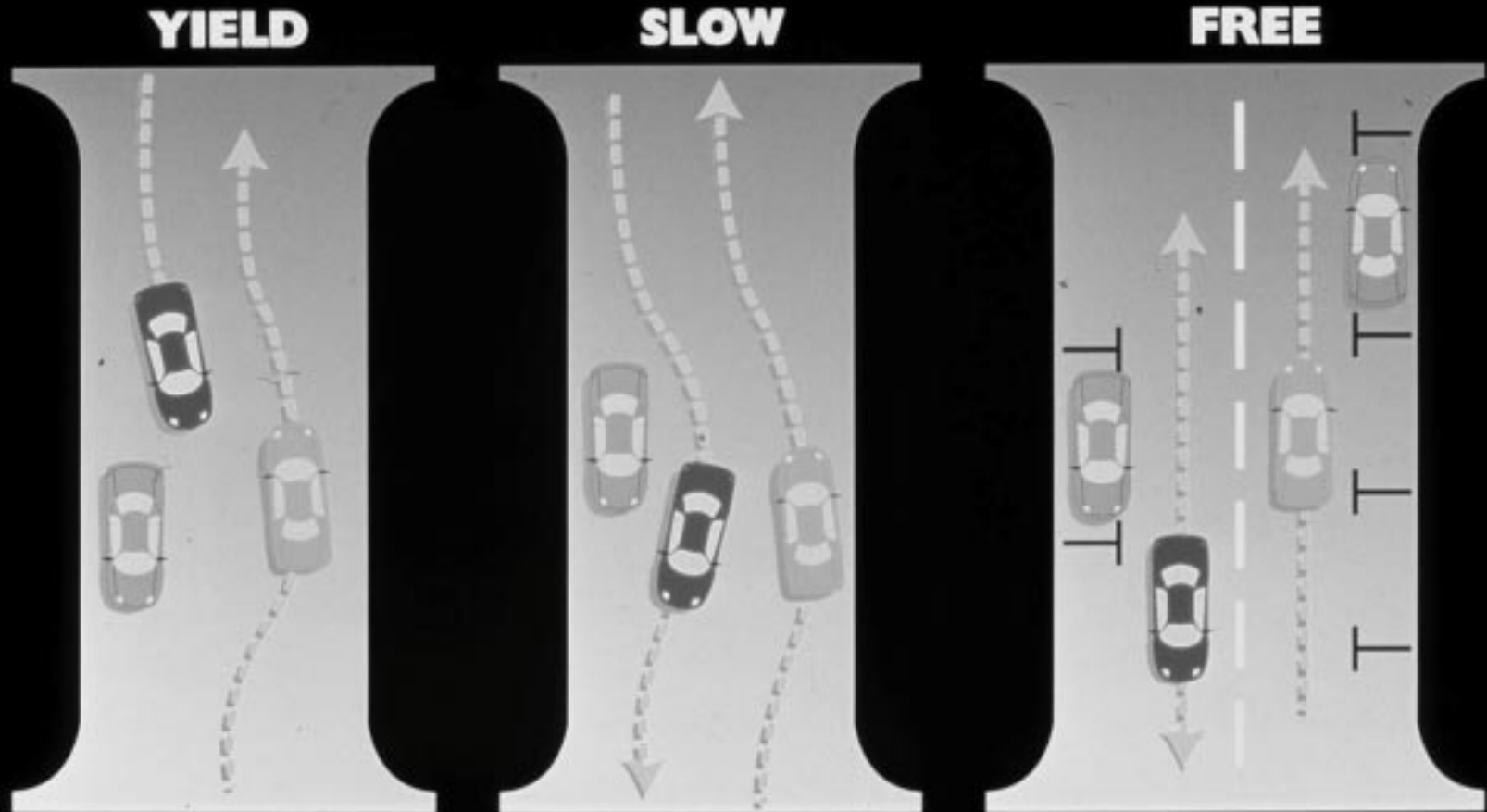
Bikes

Trees

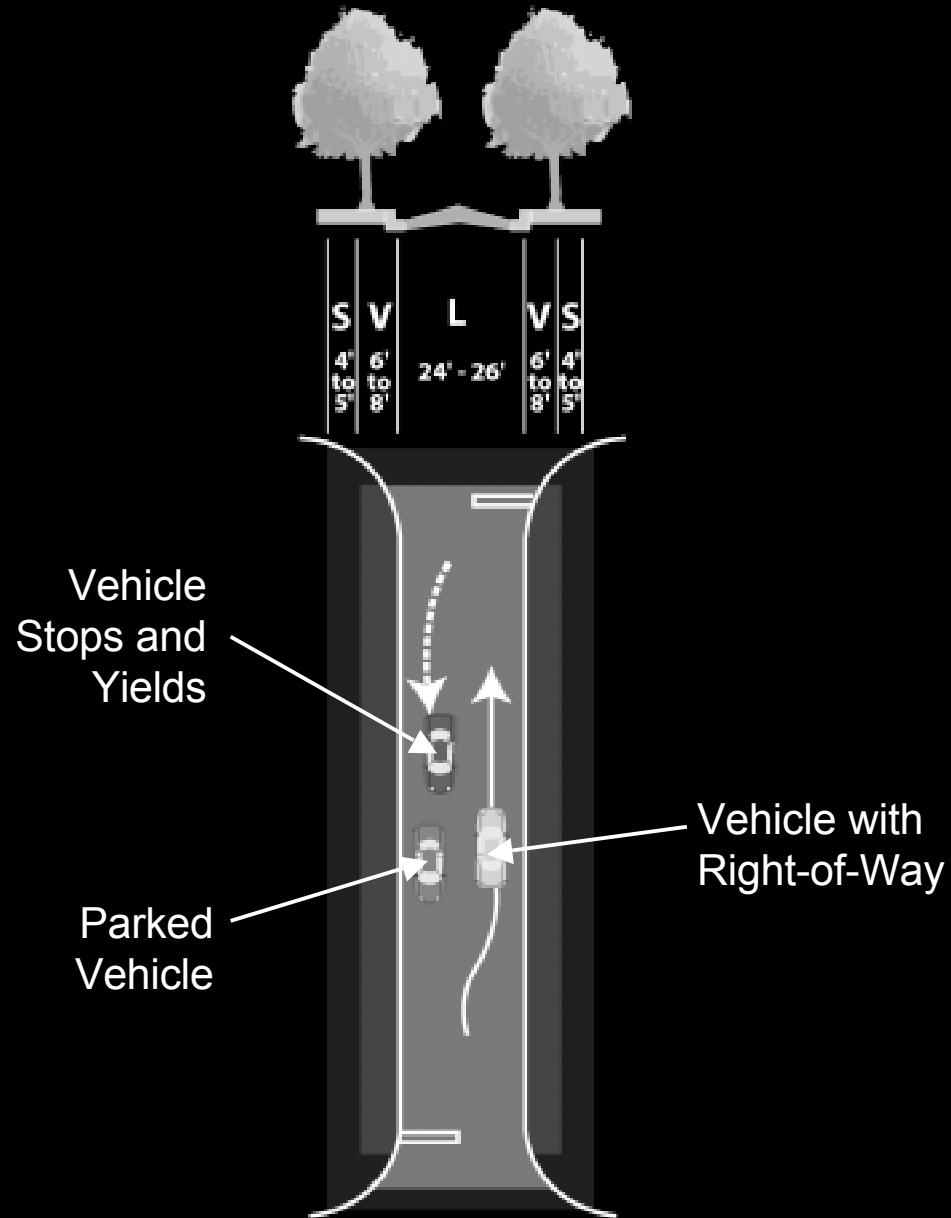
Lights



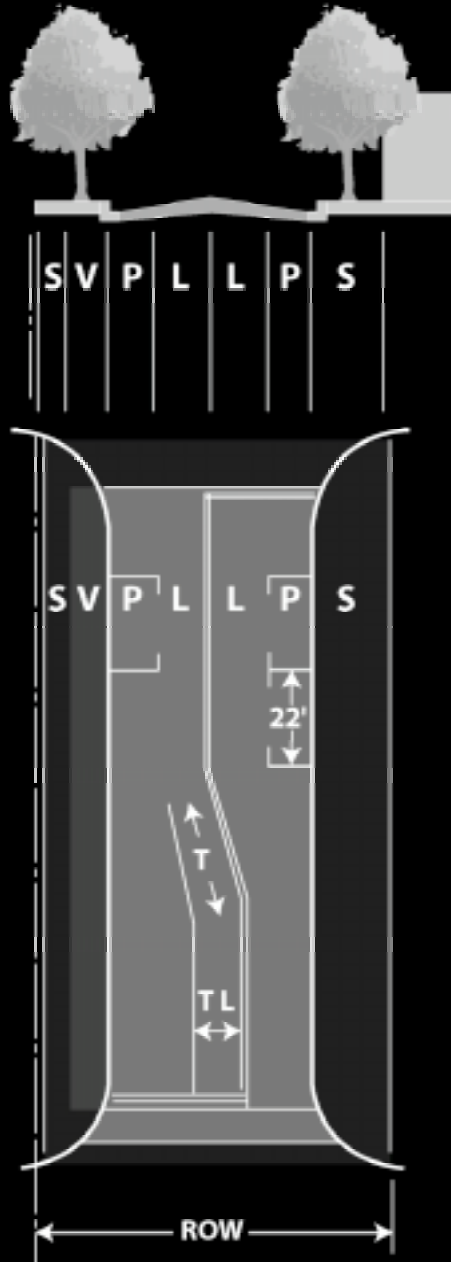
Flow Modes



Single-Lane "Yield Street"



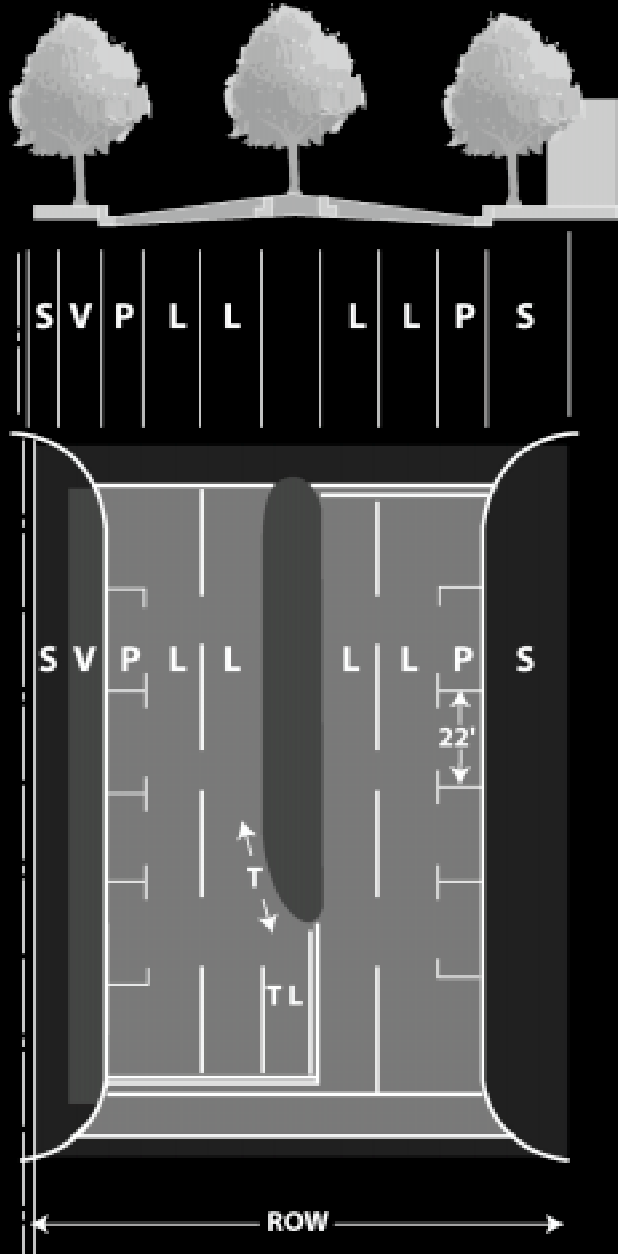
Cross Section Elements



Dimension Cross-section Elements (Feet)

Design Element		Functional Class		
		Art	Col	Loc
L	Traffic Lane	12	11	10
TL	Turning Lane	12	11	10
P	Parking Lane	8-10	8	7
V	Verge (Planting Strip)	8-12	8-12	6-8
S	Sidewalk (Business)	12-18	12-18	12-18
S	Sidewalk (Residential)	5-6	4-5	4-5
T	Taper Length	60	40	30
R	Curb Radius	25	20	15-20

Cross Section Elements



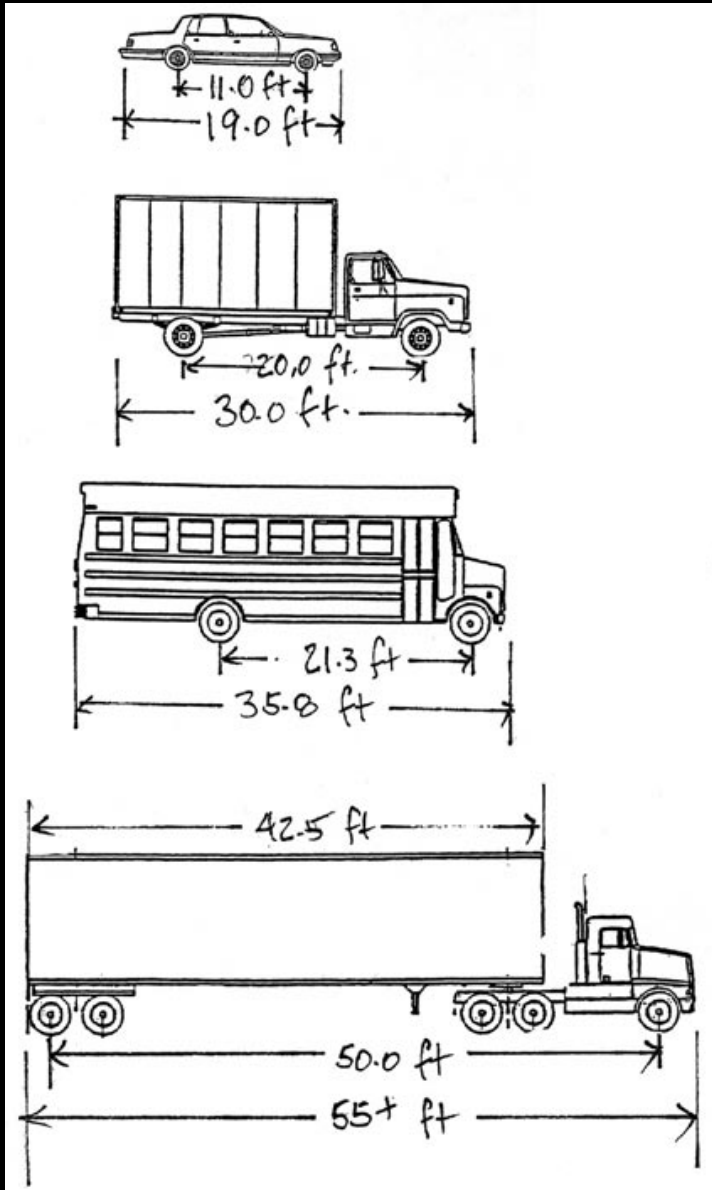
Dimension Cross-section Elements (Feet)

		<i>Functional Class</i>		
Design Element		Art	Col	Loc
L	Traffic Lane	12	11	10
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S	Sidewalk (Business)	12-18	12-18	12-18
S	Sidewalk (Residential)	5-6	4-5	4-5
M	Median	12-16	10-16	10-16
R	Curb Radius	25	20	15-20

Back-In Angle Parking



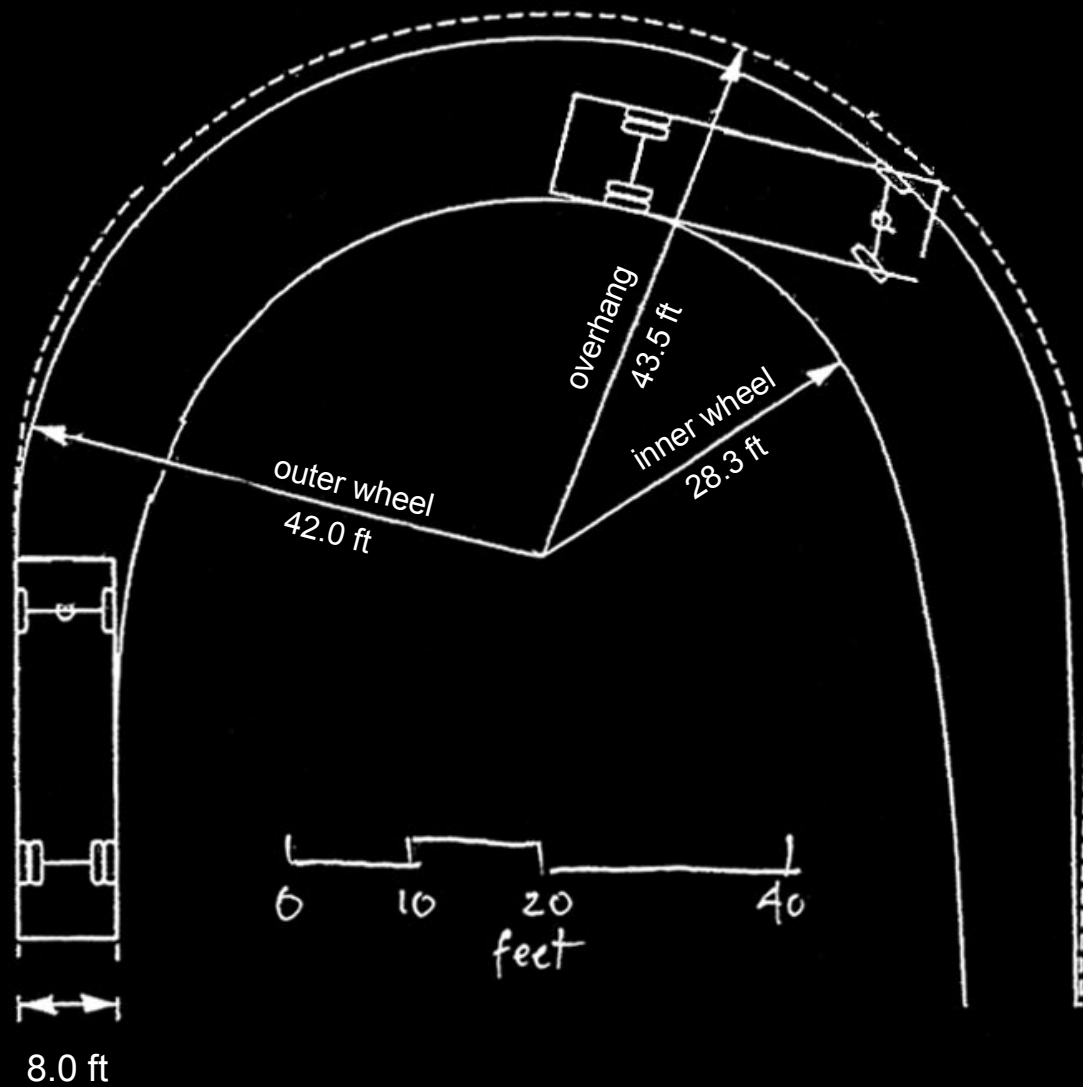
Design Vehicles



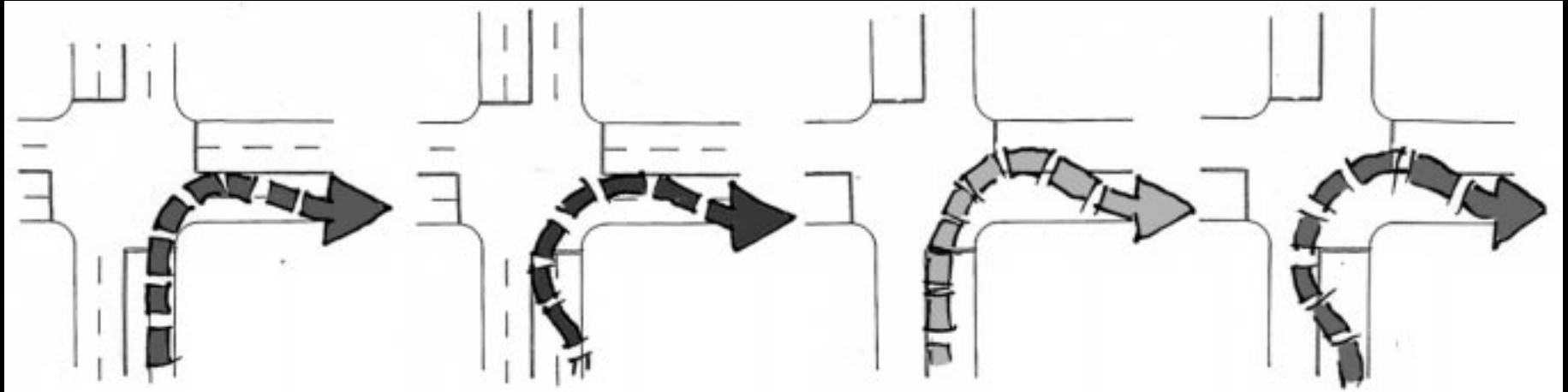
Street Classification

	Design Vehicle		
	Passenger Car "P"	Single Unit Truck "SU-30"	Tractor-Trailer "WB-50"
Arterial		●	●
Collector	●	●	
Local	●		

Single Unit ("SU") Truck Turning Radius



Types of Encroachment



#1: Use full departure leg

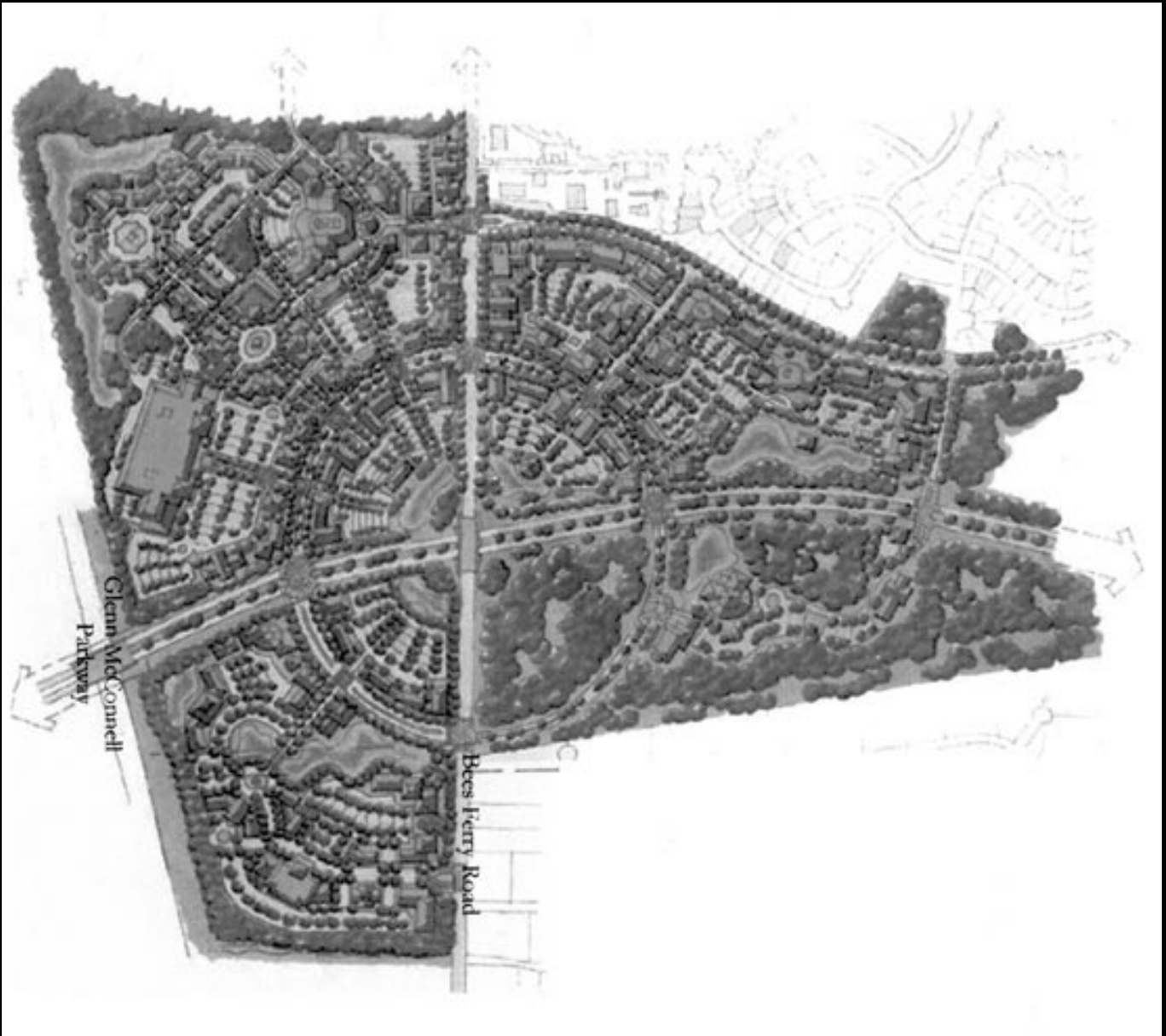
#2: Use full approach and departure leg

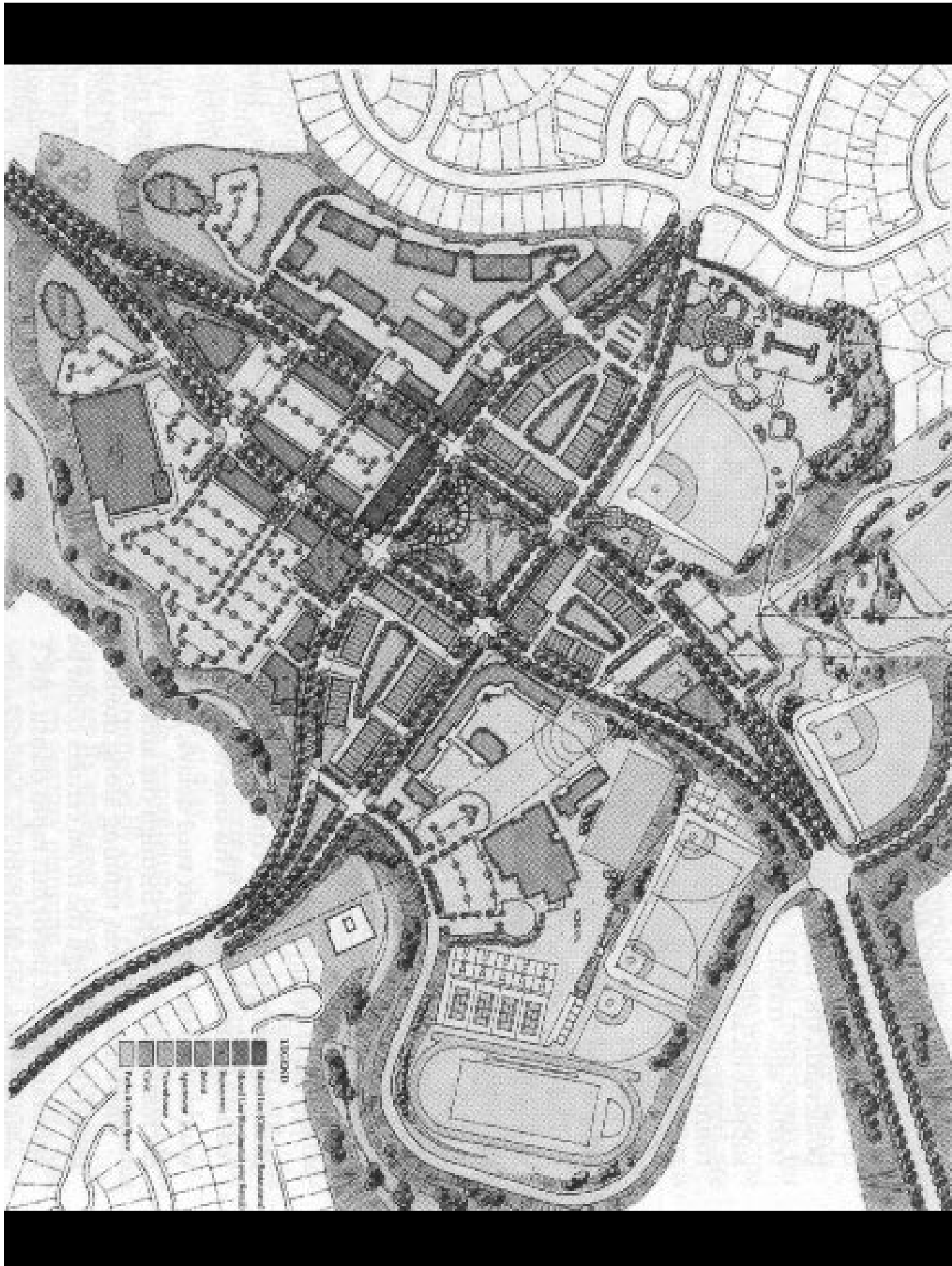
#3: Encroach across departure centerline

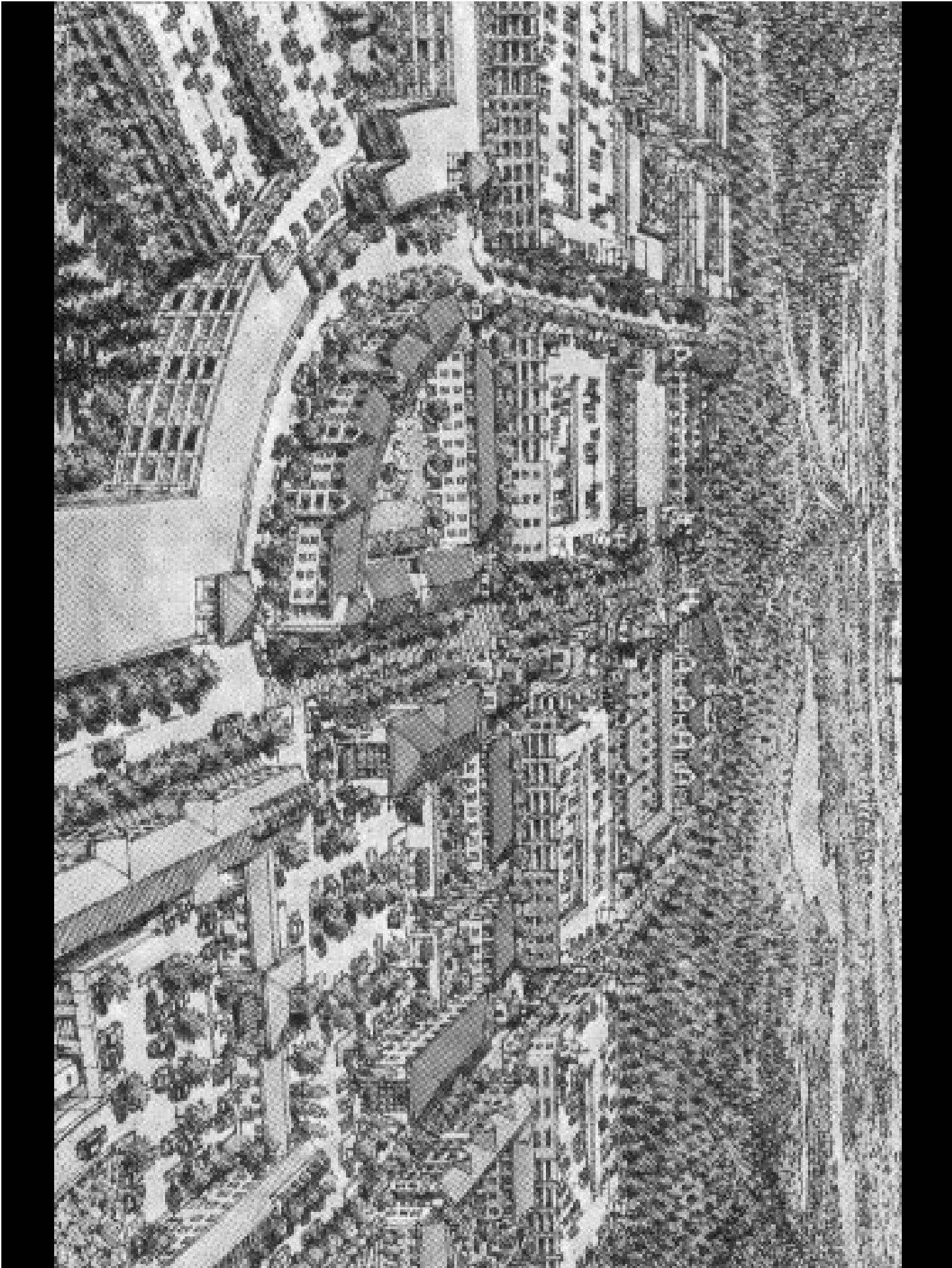
#4: Encroach across departure and departure centerline

		To (Departure Street)		
		Art	Col	Loc
From (Approach Street)	Arterial (Art)	1	2	3
	Collector (Col)	2	3	4
	Local (Loc)	2	4	4

Permissible Encroachments







Frontage Elements



Building Siting

Random

Address Street

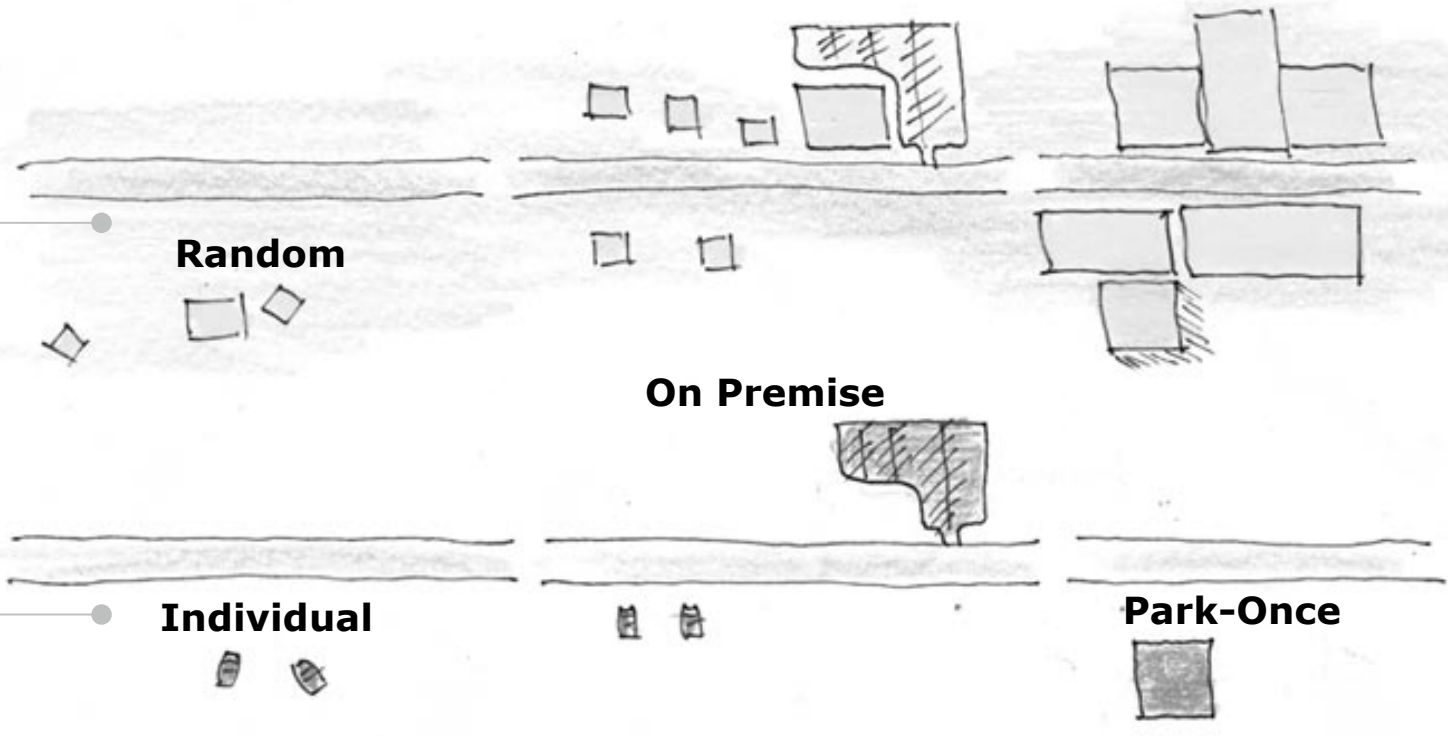
Enclose Street

On Premise

Parking

Individual

Park-Once



Building Site

Angle at 500 Feet



THEME

Parking

Frontage

90° DISTANCE

300 Ft

30 Ft

DRIVER CUE

Abstract,
Point

Real,
Linear

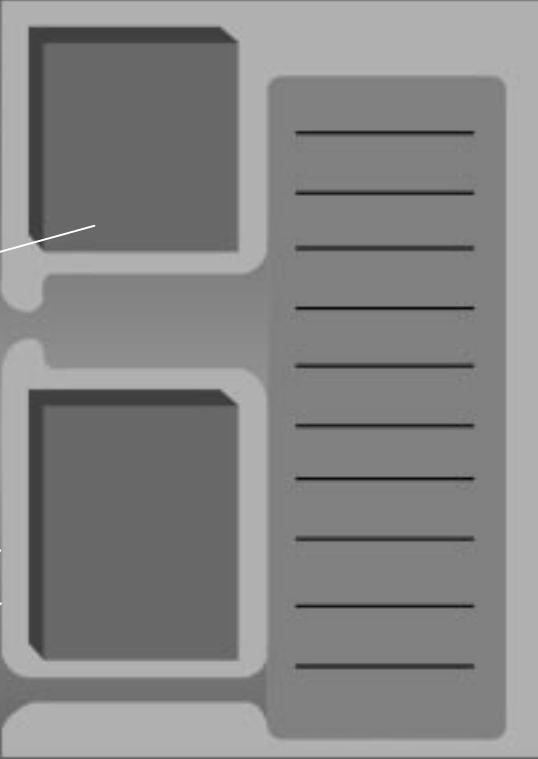
PARKING FORWARD

BUILDING FORWARD

DESIGN SPEED

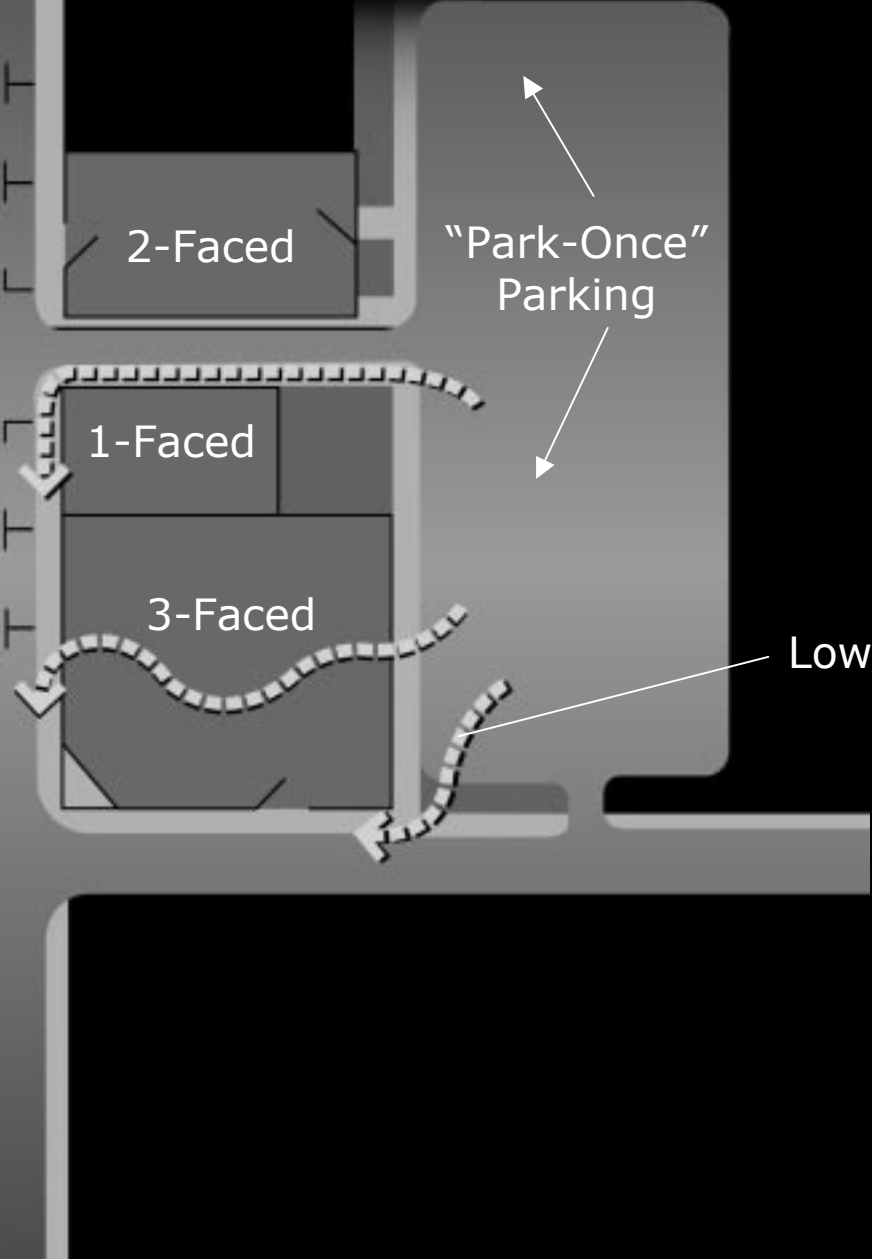
50-60 mph

20-30 mph



Off-Street Parking

Continuous
Vibrant
Walk



2-Faced

"Park-Once"
Parking

1-Faced

3-Faced

Low Threshold



“Put the Fat Chicken Out Front” – David Butterfield



Face 2 – Parking Lot



Face 1- Town Center



Face 2 - Boulevard



Face 3 - Parking Lot



“Put the Fat Chicken Out Front” – David Butterfield

Walgreens

PHARMACY





Grocery Store





Self-Storage Facility



Mixed Uses



Back Turned on Street

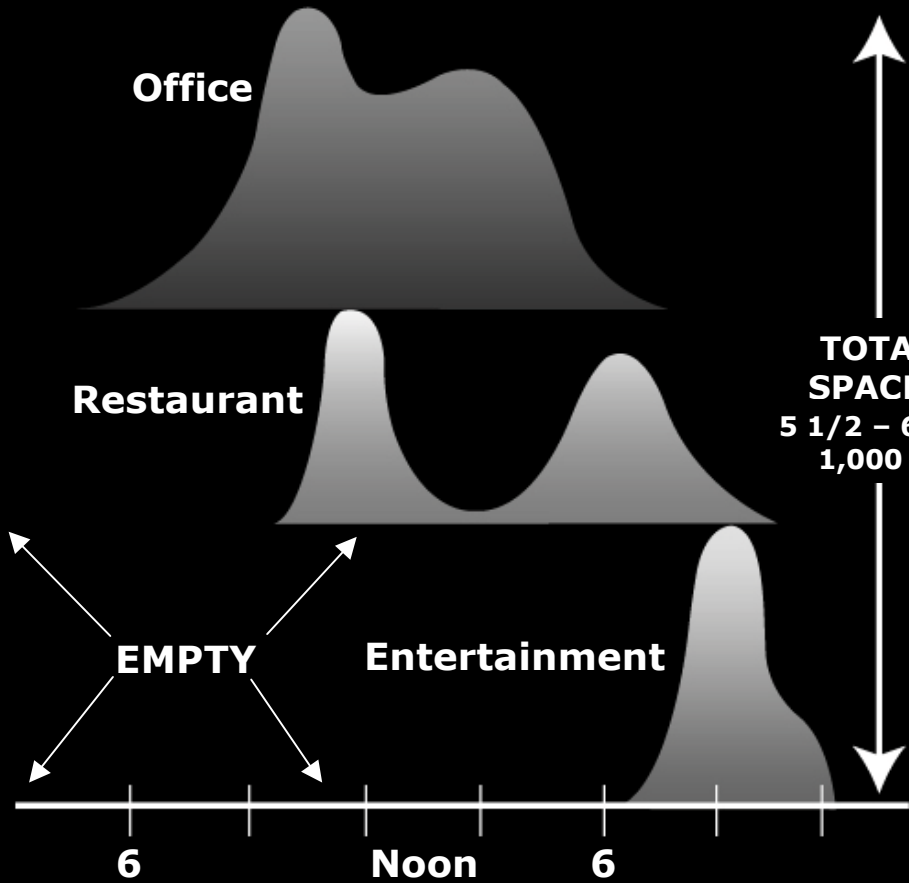


Back Turned on Street



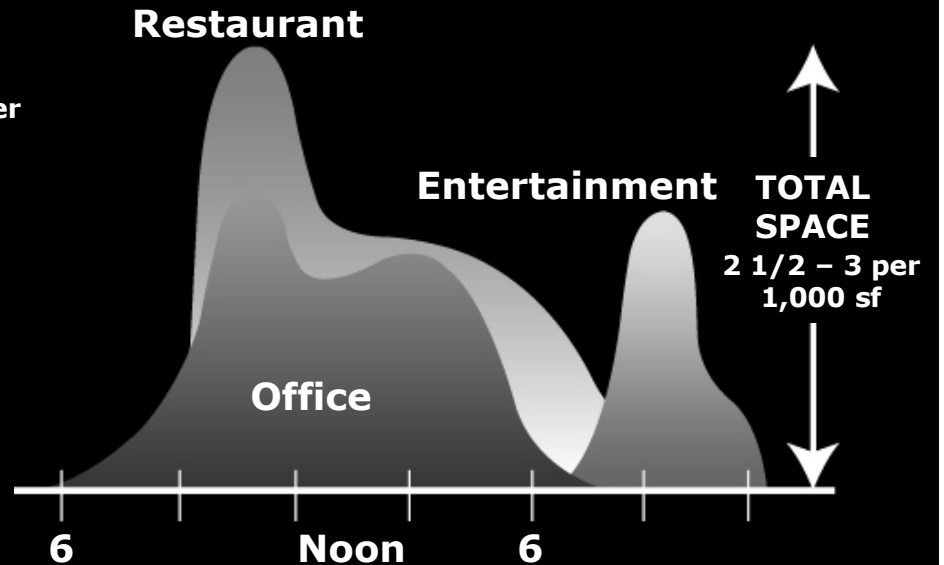
Front Turned to Street



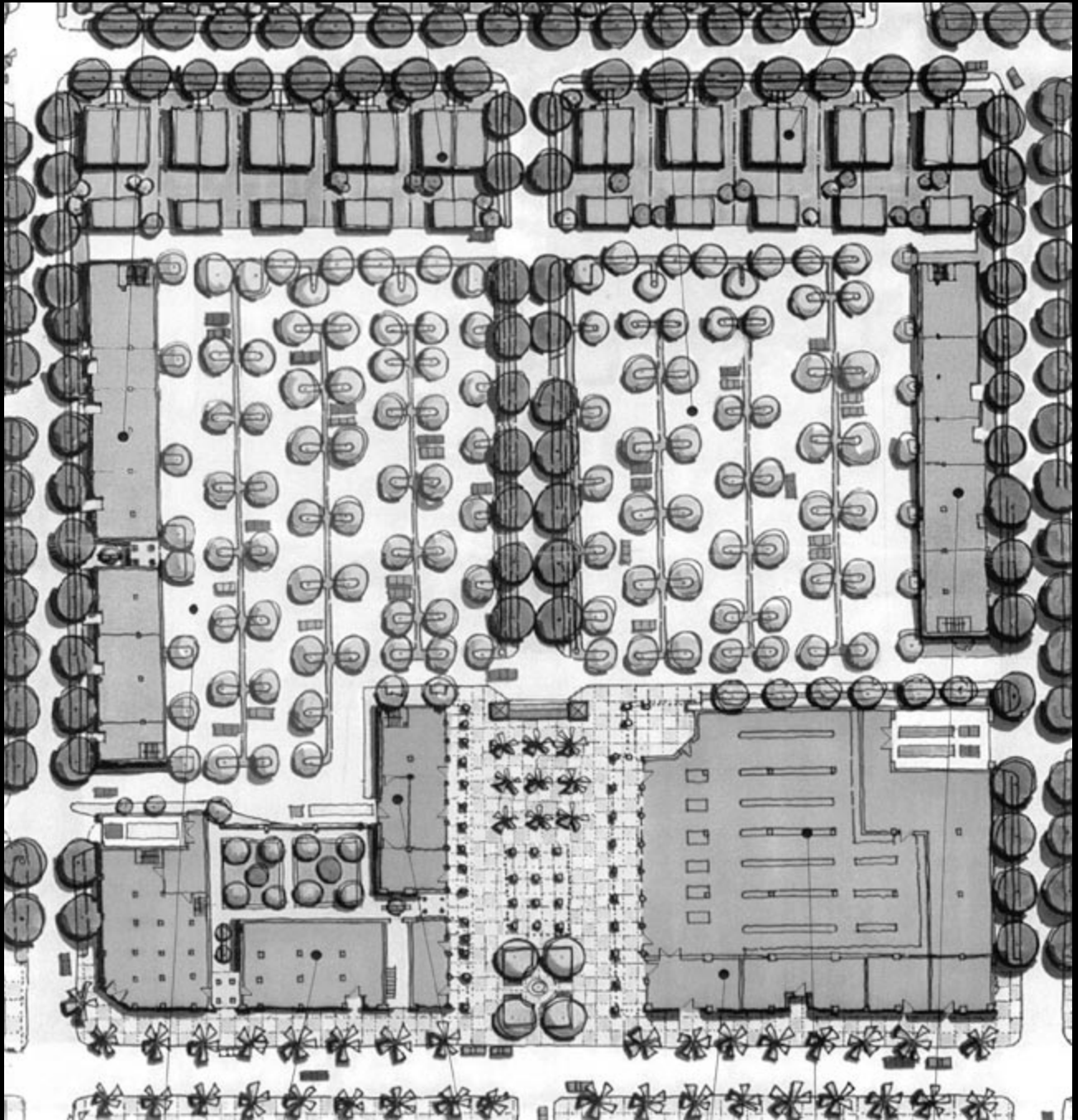


Exclusive Parking

TOTAL SPACES
5 1/2 – 6 per 1,000 sf

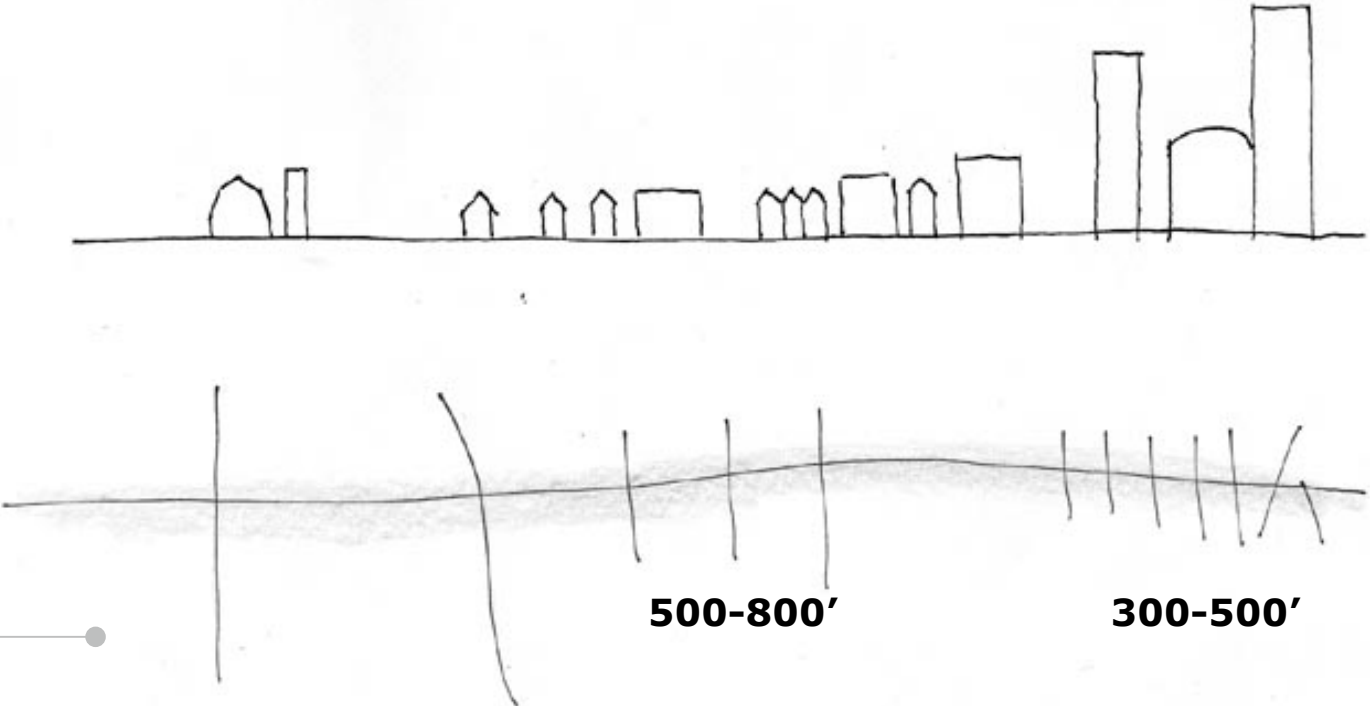


Shared Parking

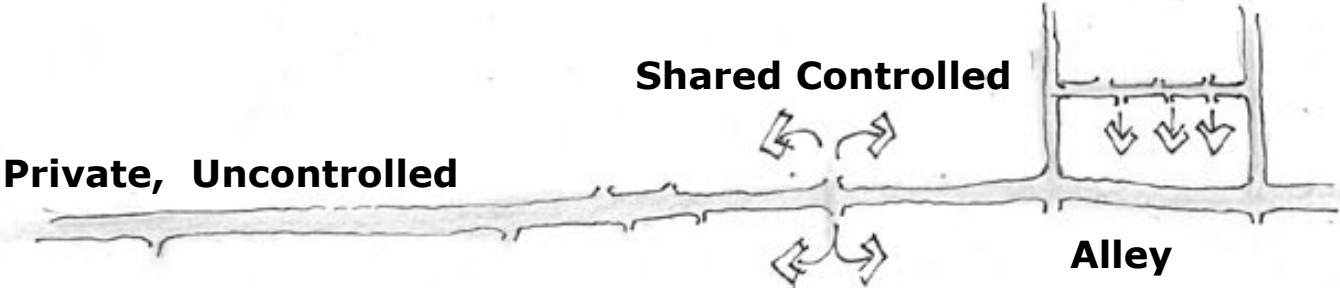


Network Elements

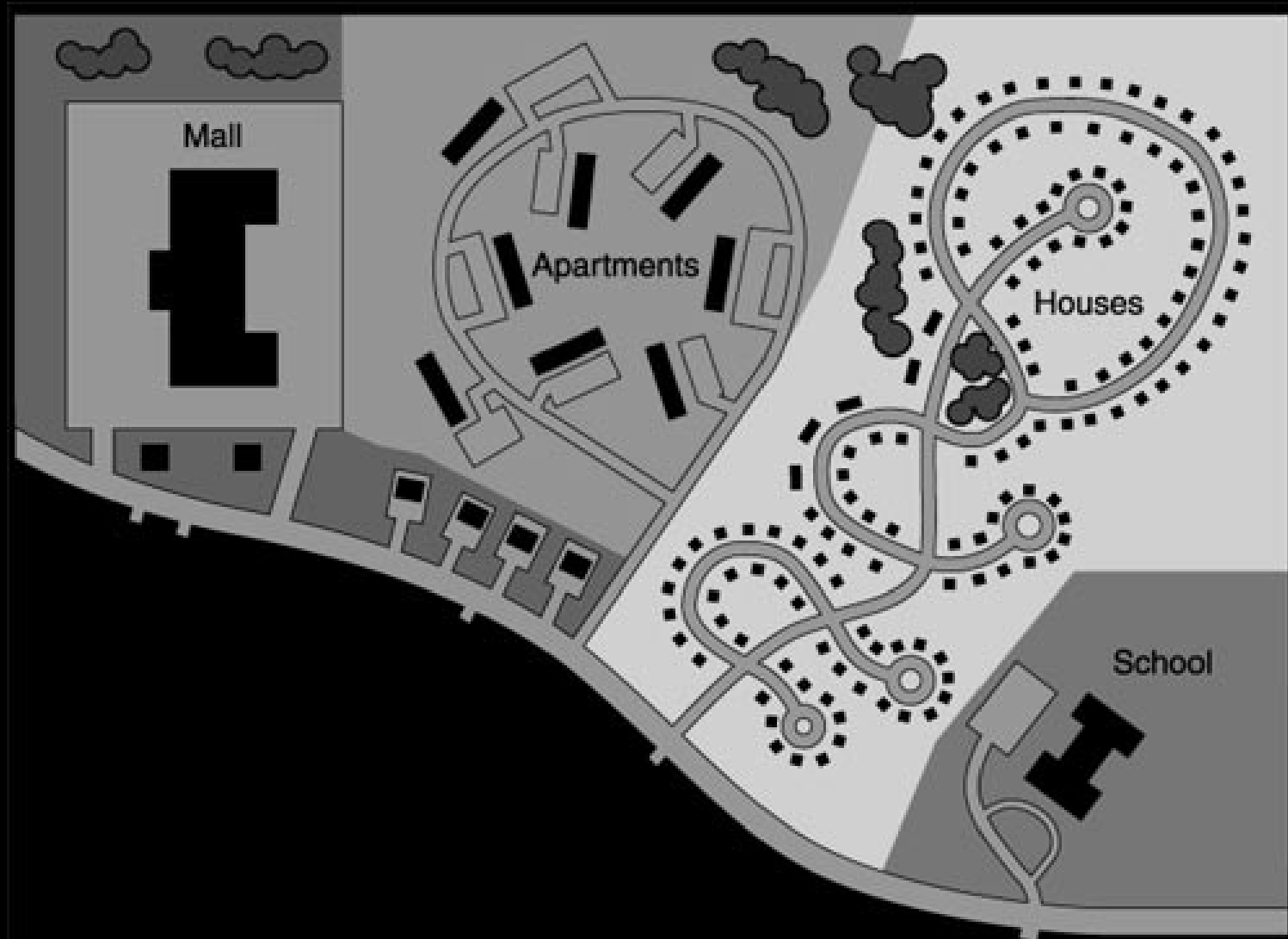
Street Spacing



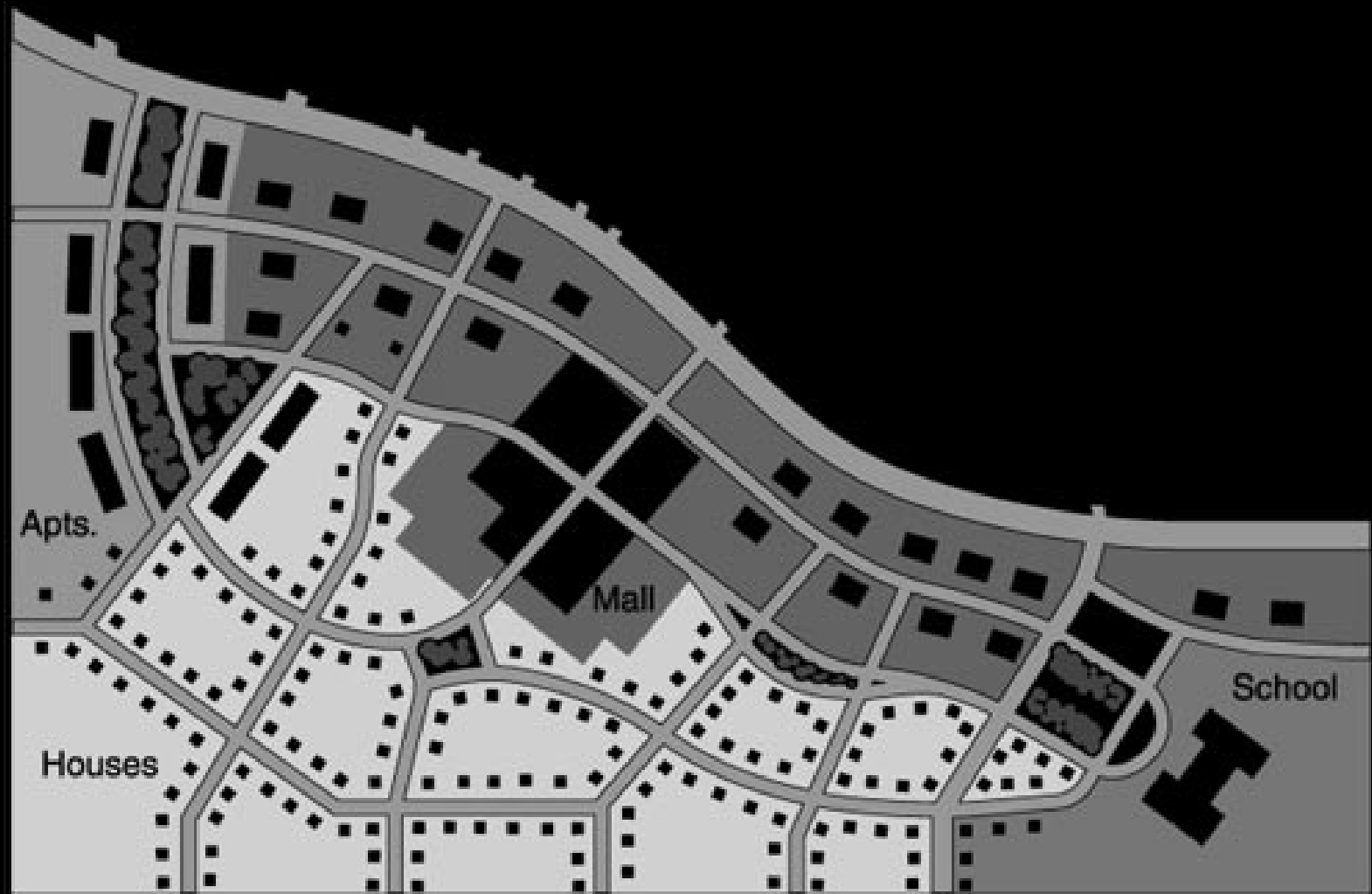
Street Access



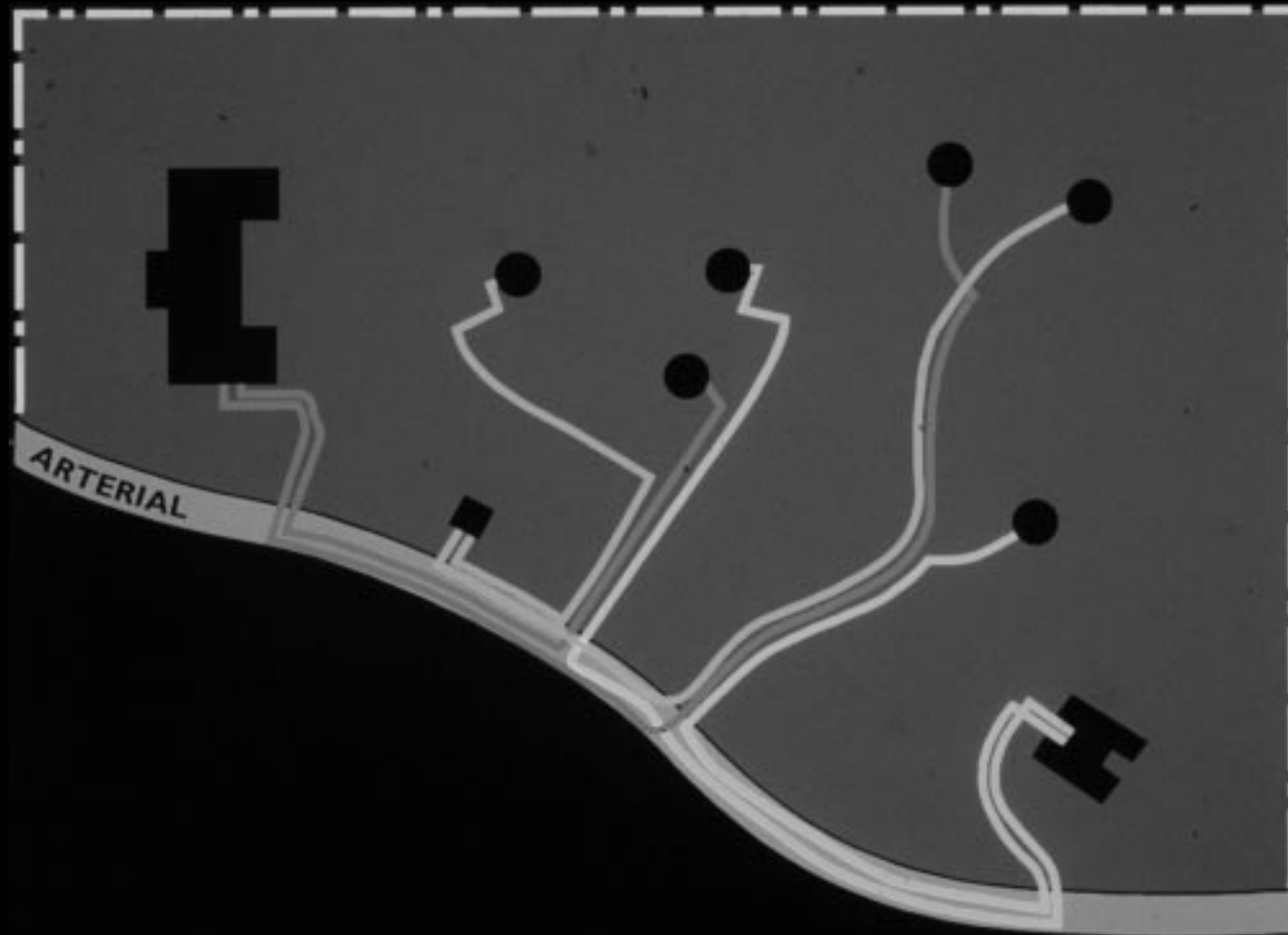
Conventional



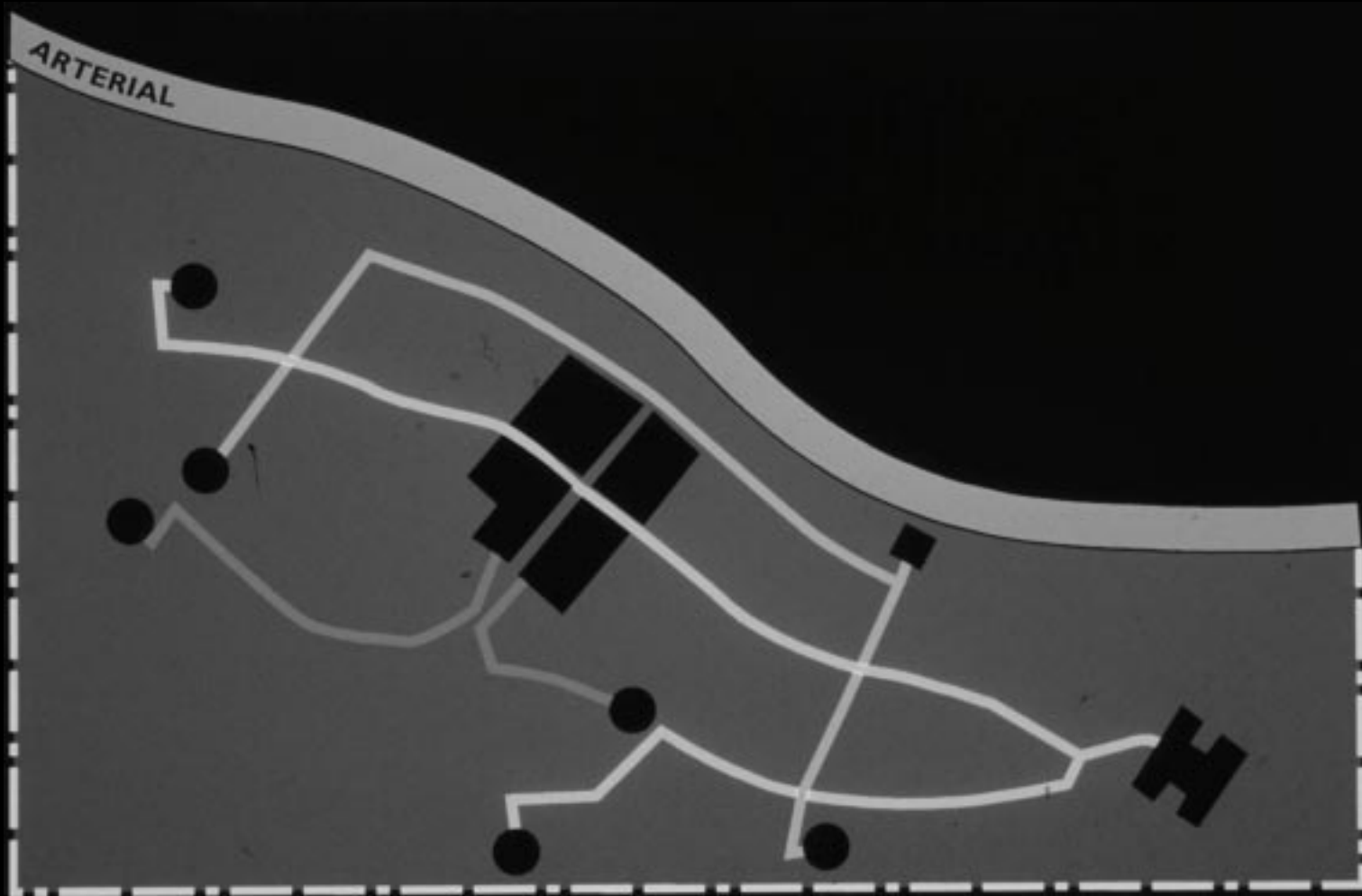
Traditional



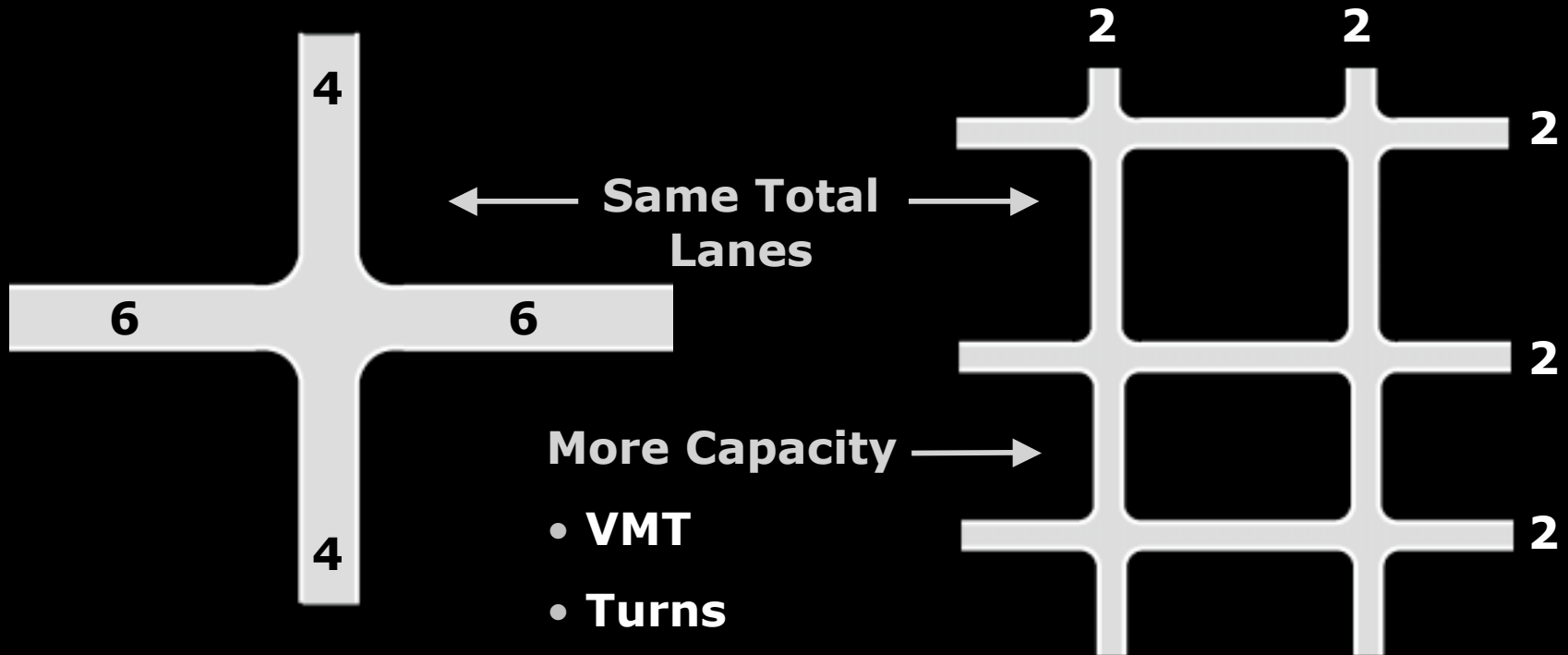
Trip Assignment: Conventional



Trip Assignment: Traditional



Network and Capacity

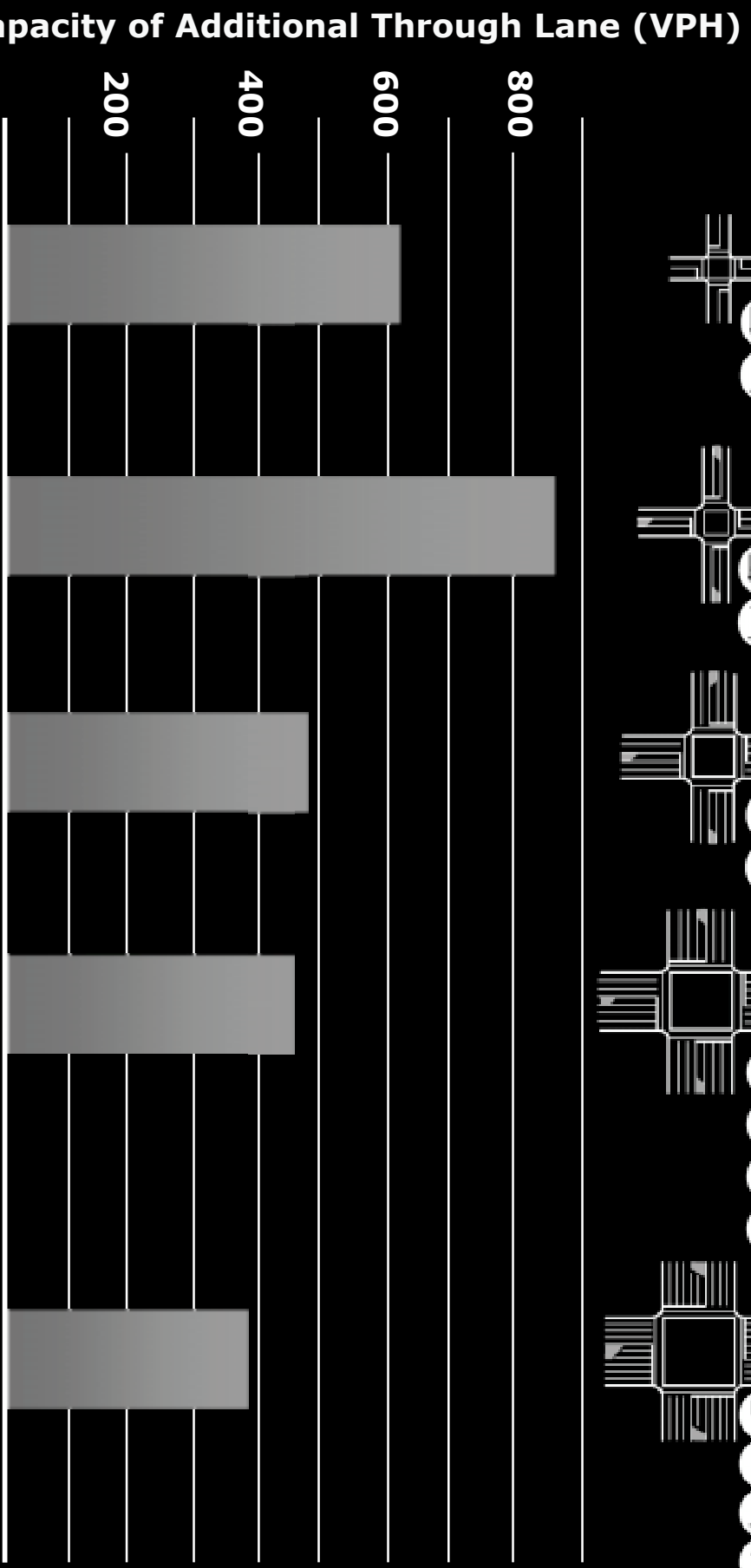
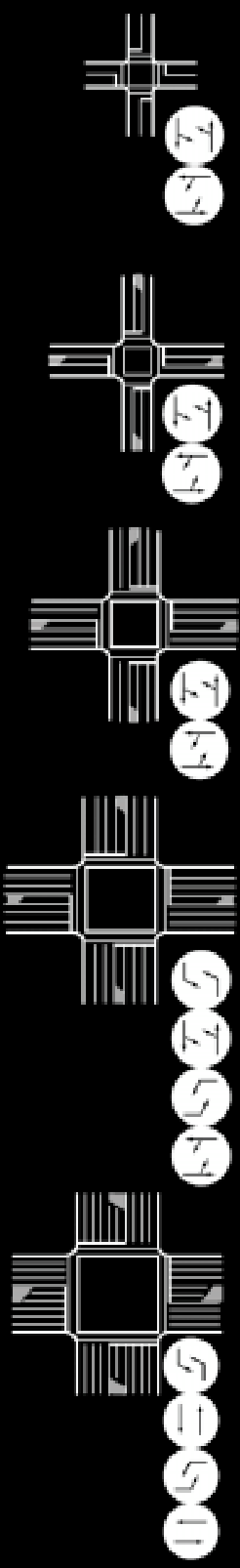


More Capacity →

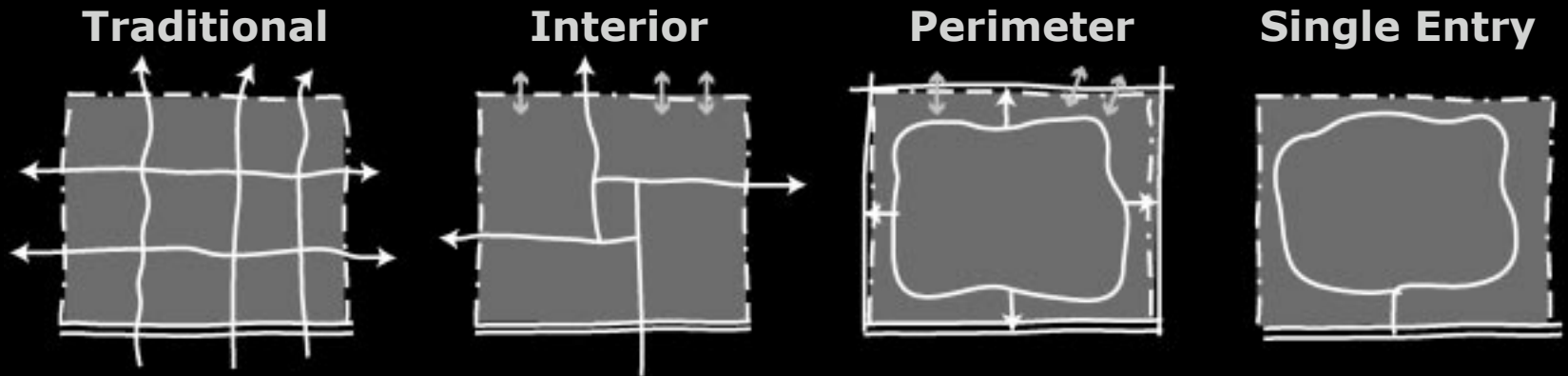
- VMT
- Turns
- Clearance Time
- Signal Phase



Incremental Efficiency



Connectivity Options



Connected Street Spacing

400' – 600'

1000'

1000' – 2000'

None

Ped/Bike Spacing

400 – 600

400 – 600

400 – 600

None

Connected Road Character

All Streets Fronted

Connectors Fronted

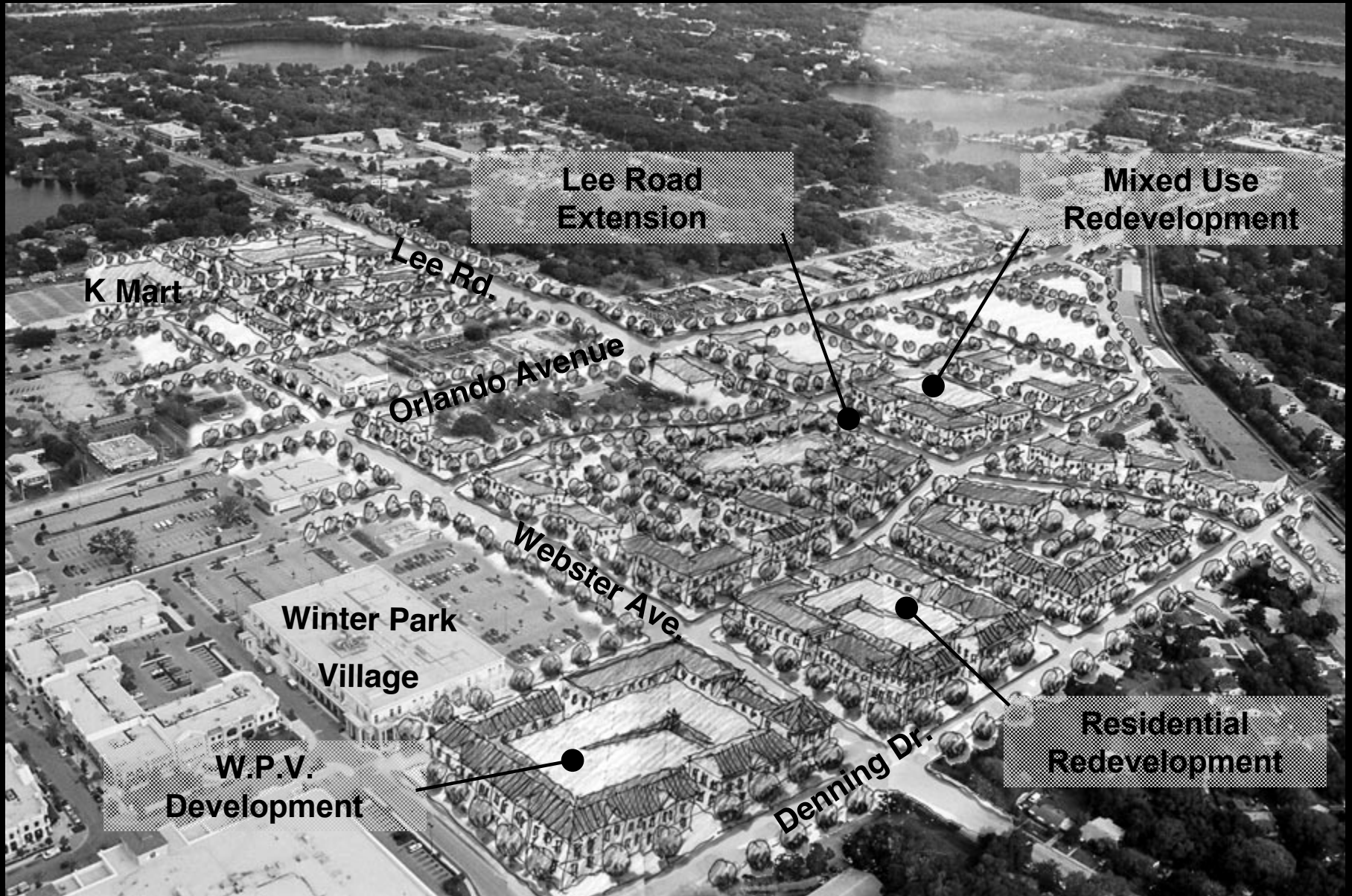
Connectors Walled

(No Connection)

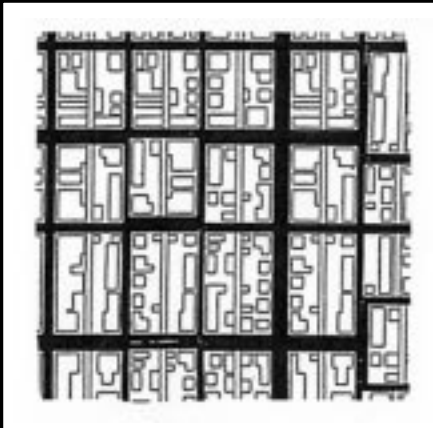
Village-Scaled Network near Intersection



New Streets and Blocks



Network Patterns



Grid



Grid & Squares



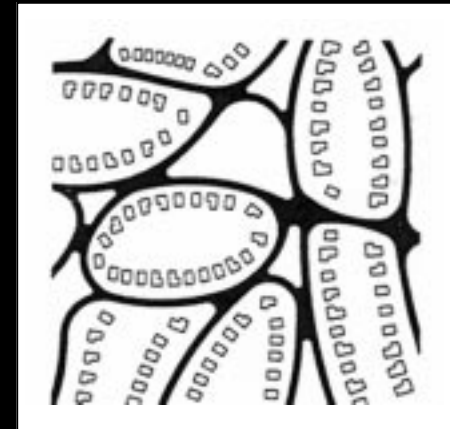
Web



Radial



Irregular



Curvilinear

Connectivity Index

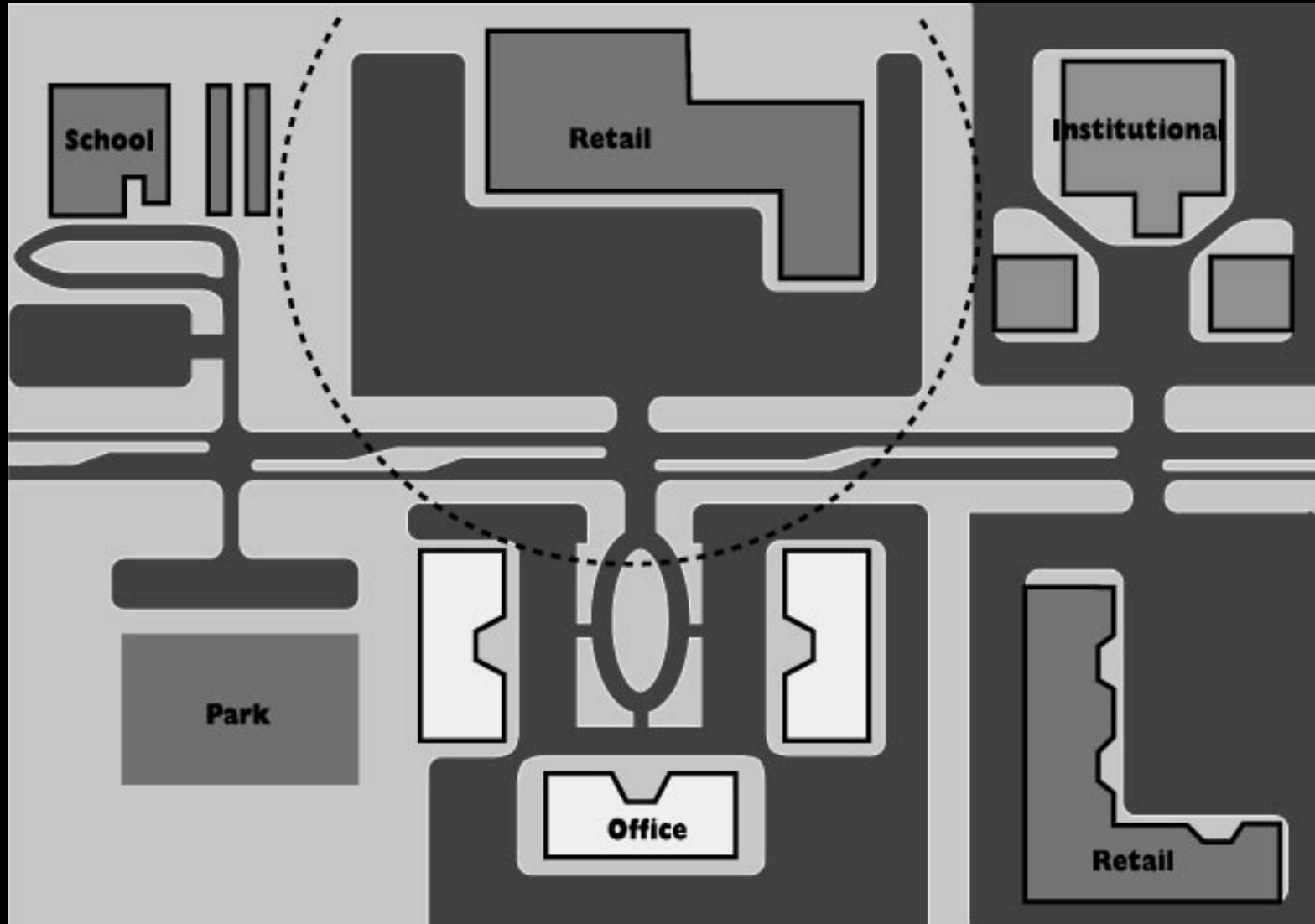


● *Links:* 11

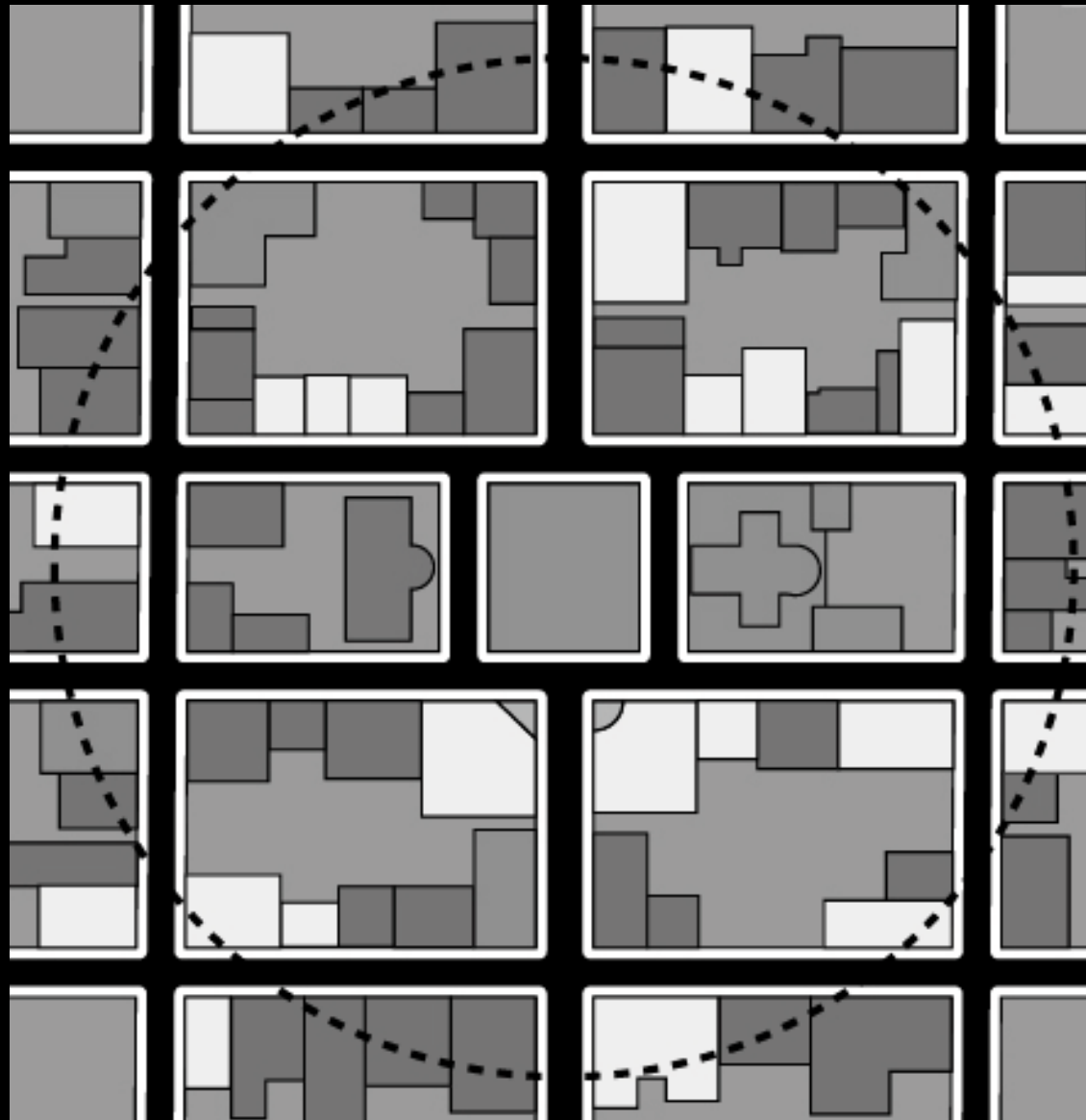
★ *Nodes:* 9 (include dead-end streets)

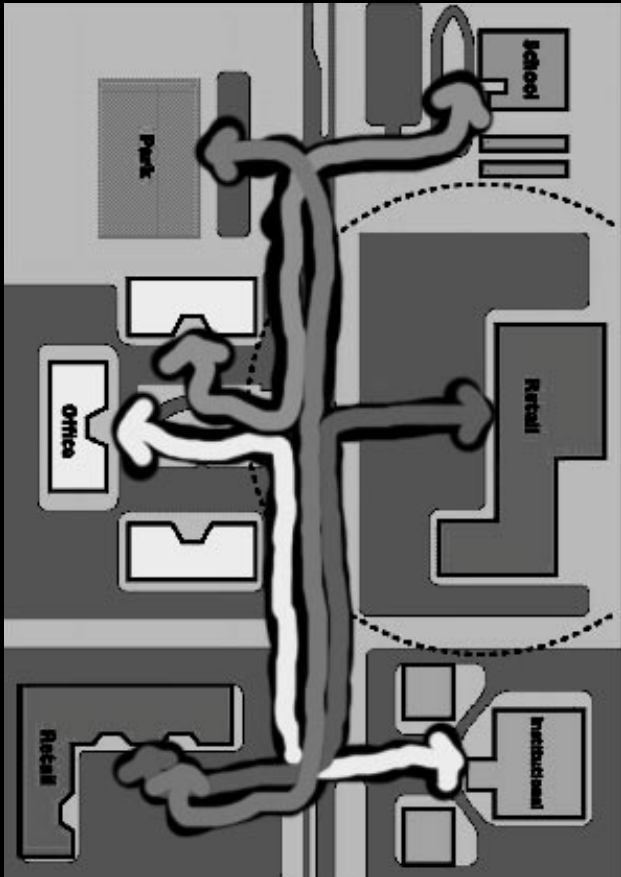
Connectivity Index = $11 \div 9 = 1.22$

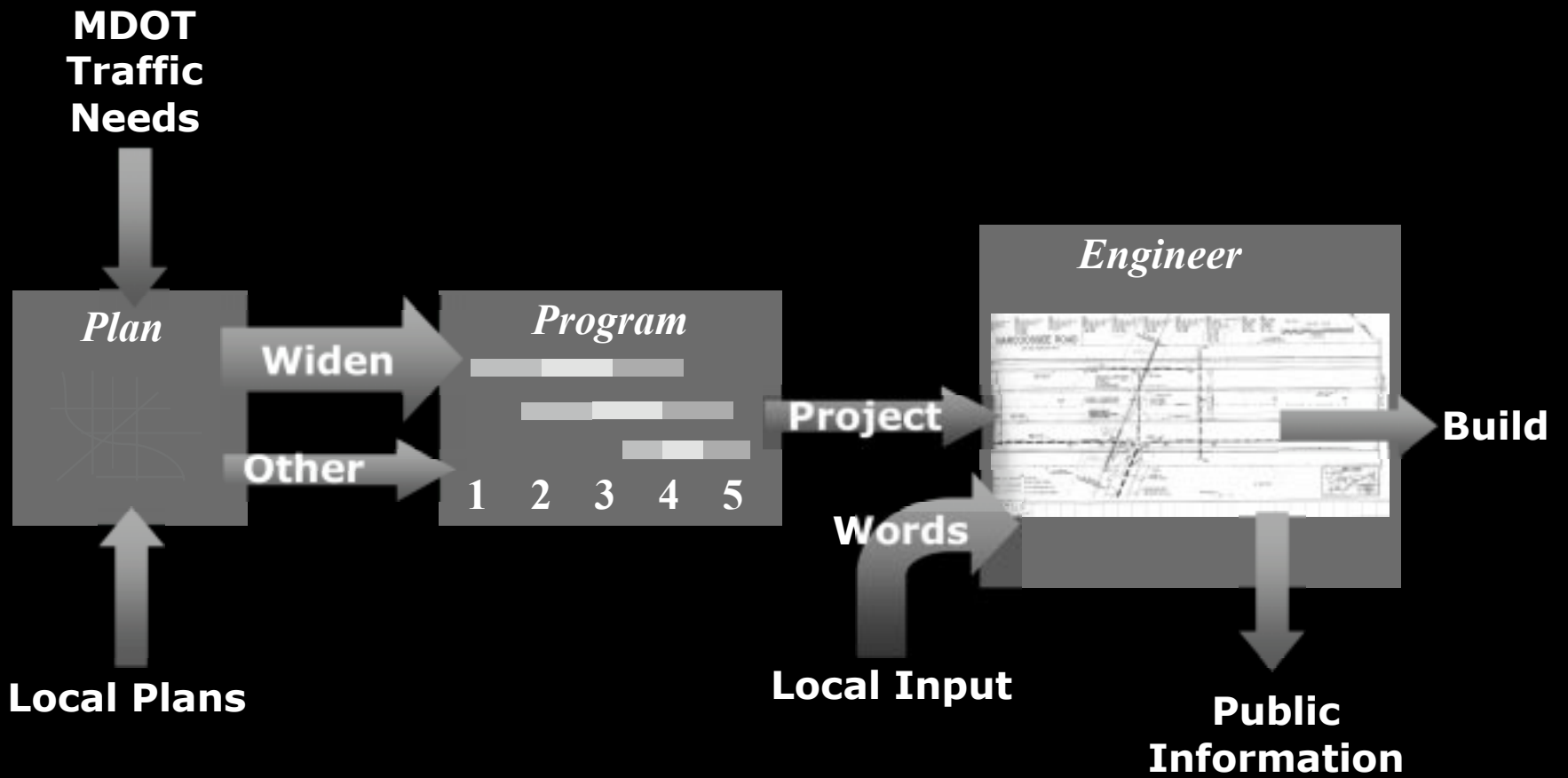
Conventional Suburban Development

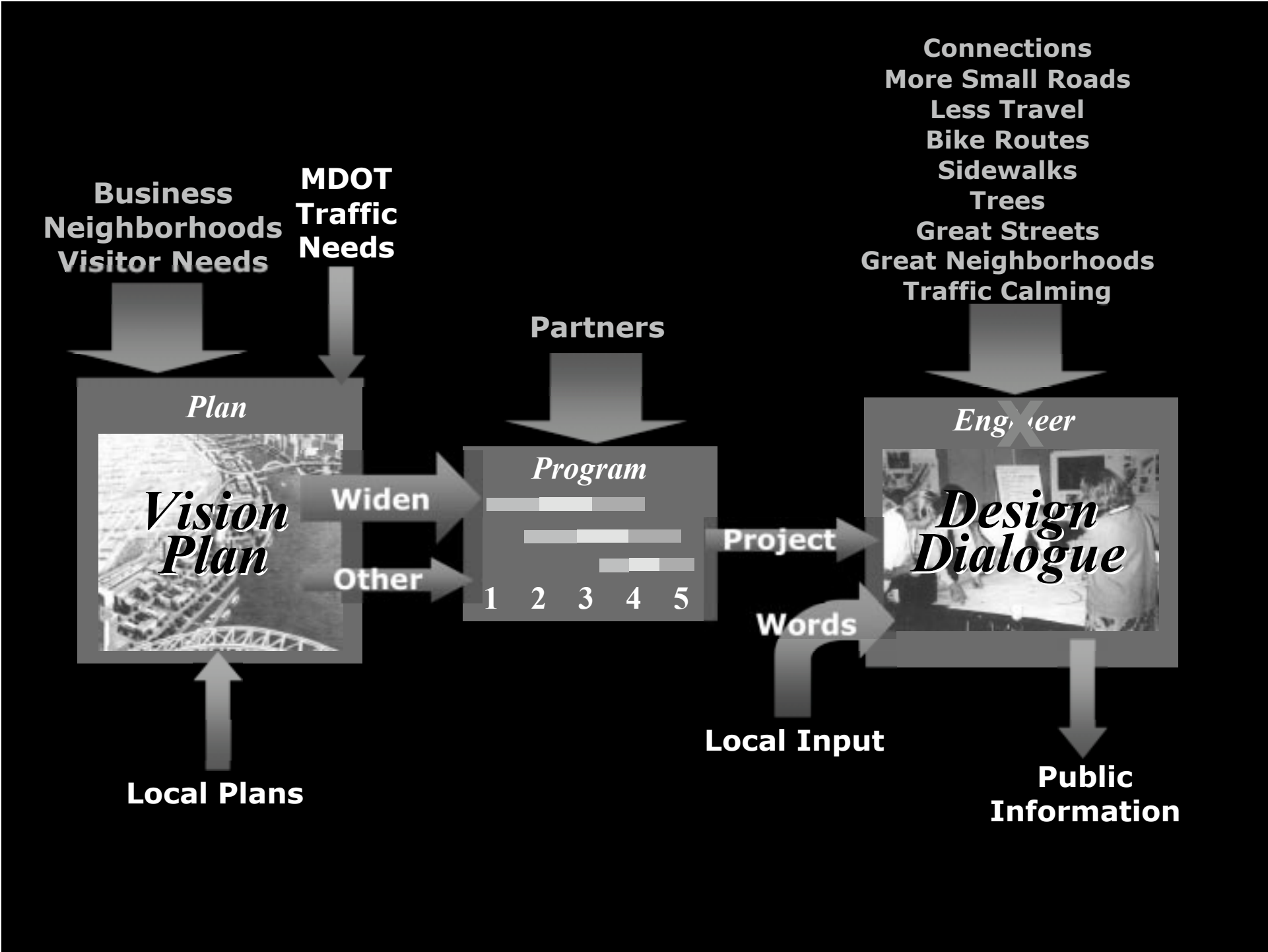


Traditional Town Center









Residential Streets

THIRD EDITION

 Urban Land Institute

 NAHB
NATIONAL ASSOCIATION
OF HOUSING BUILDERS

 ASCE
AMERICAN SOCIETY OF
CIVIL ENGINEERS

 ICSI

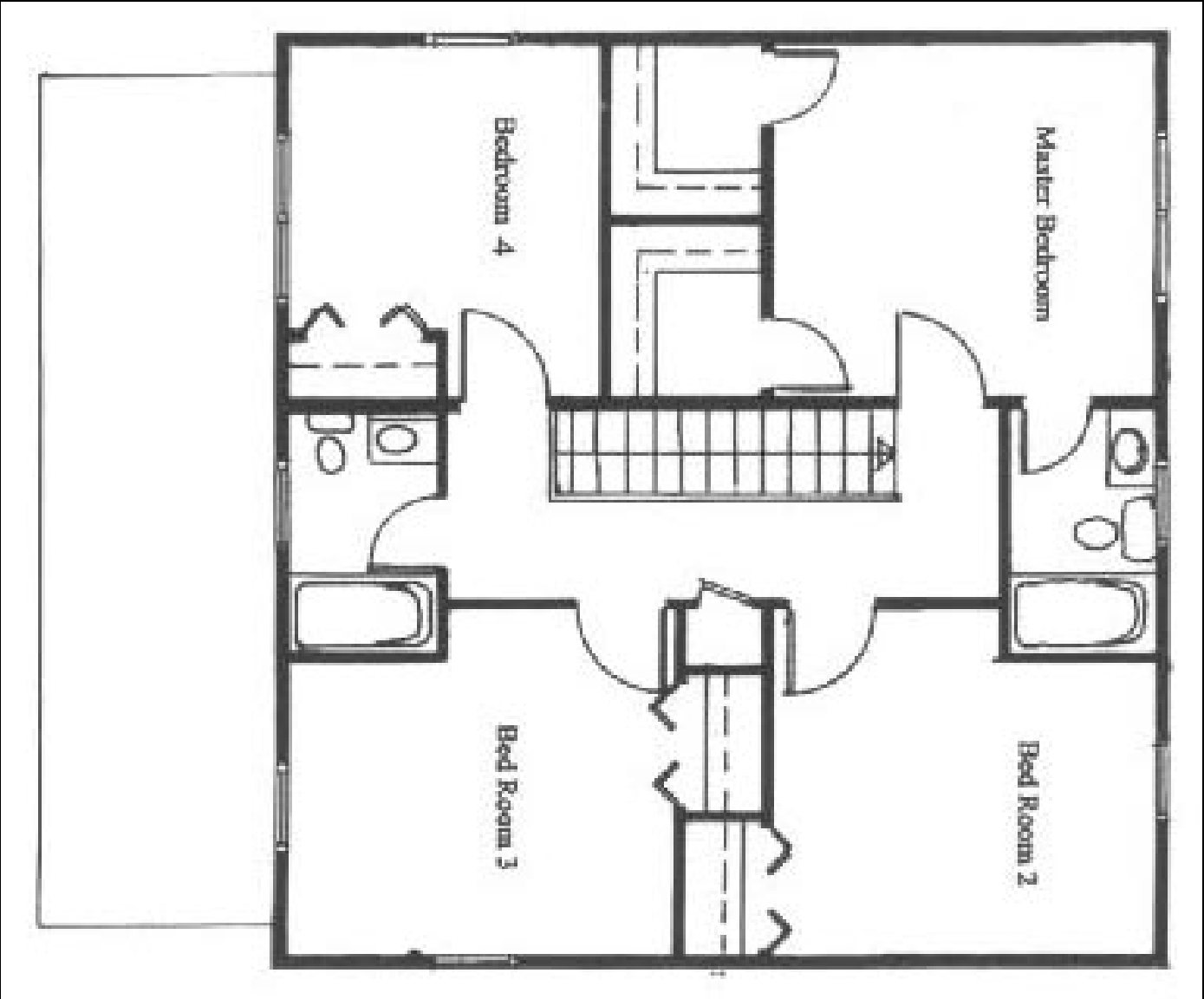
 AMERICAN ASSOCIATION
OF STATE HIGHWAY
AND TRANSPORTATION OFFICIALS

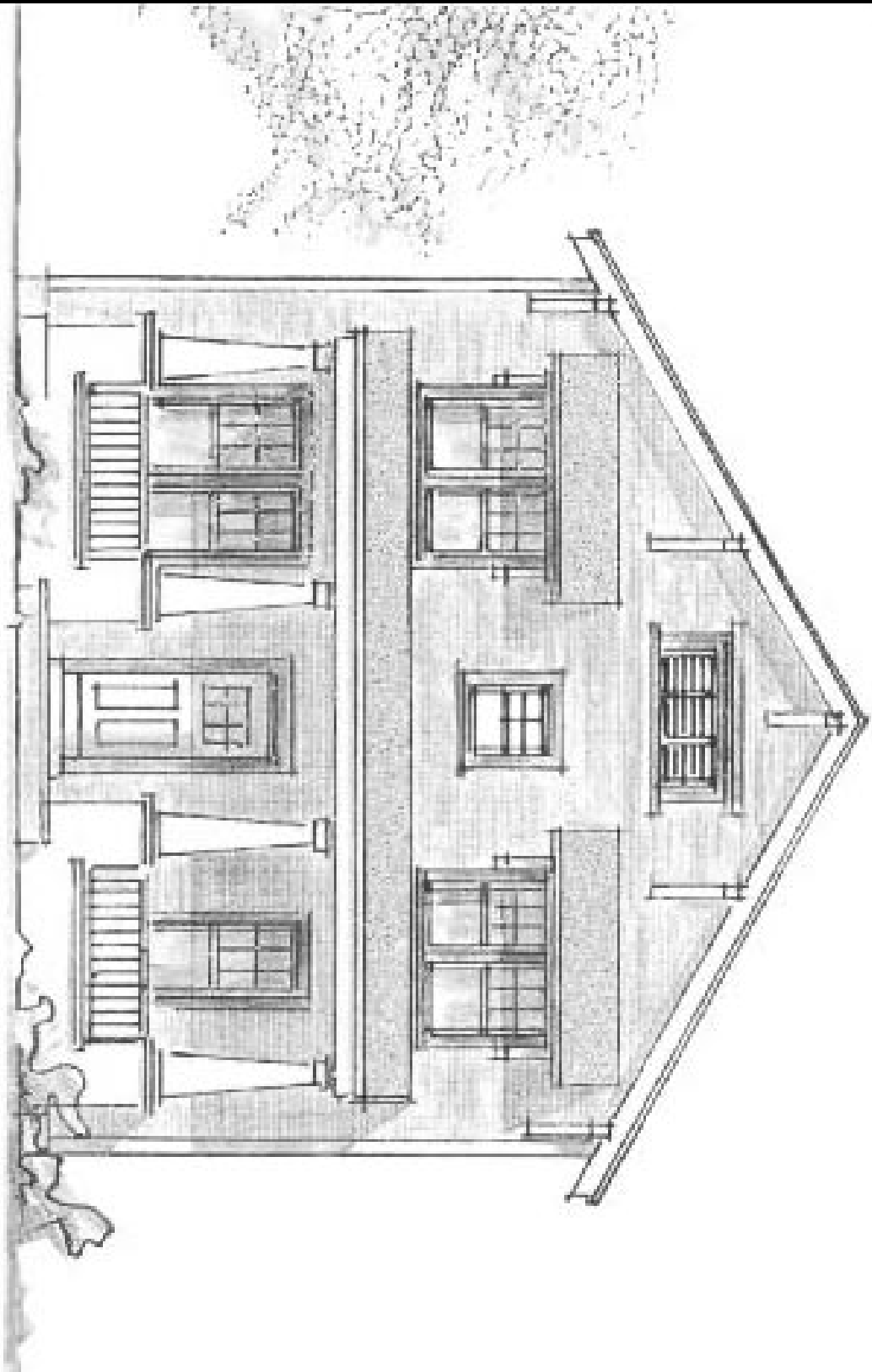
HIGHWAYS AND STREETS

2001

A POLICY ON GEOMETRIC DESIGN OF



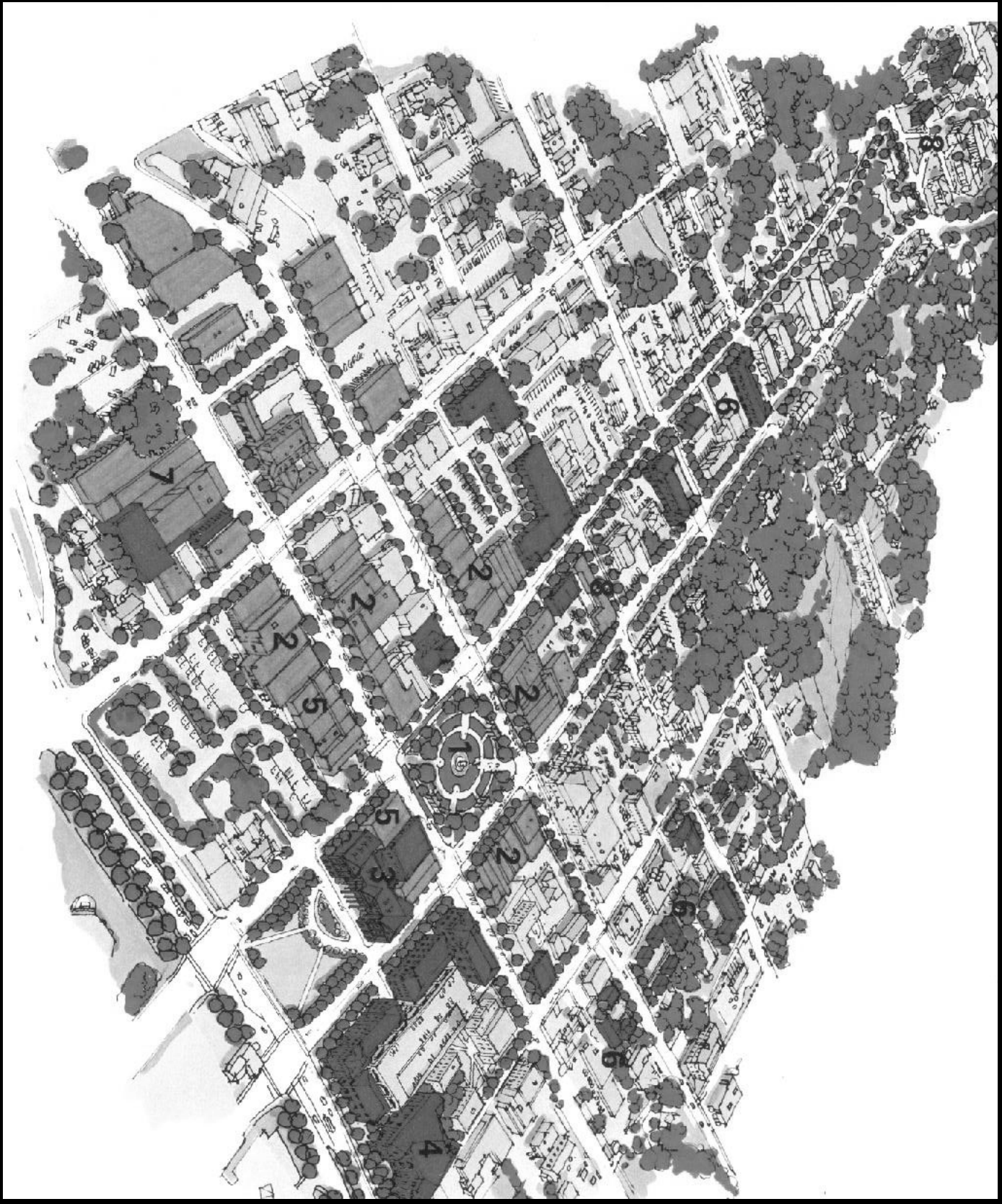


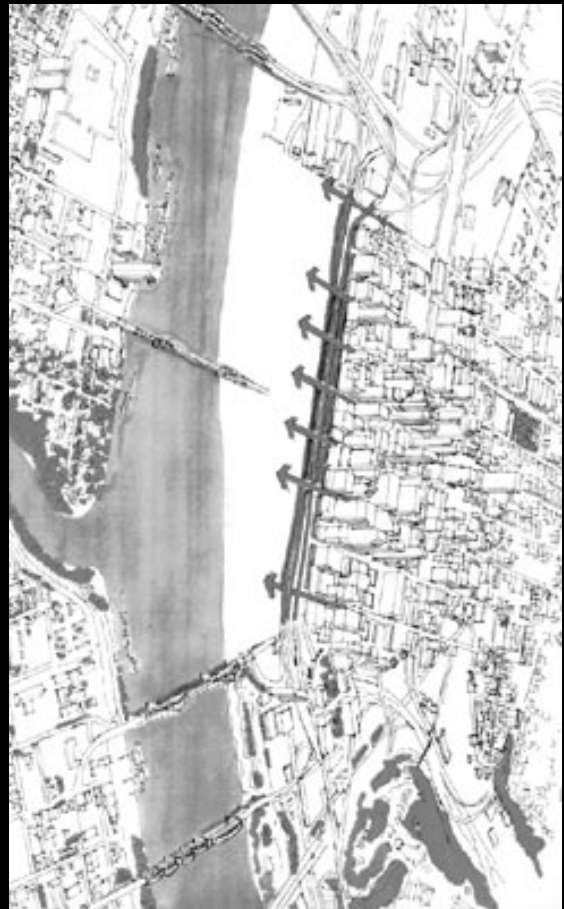


Single Family Elevation (SF4)





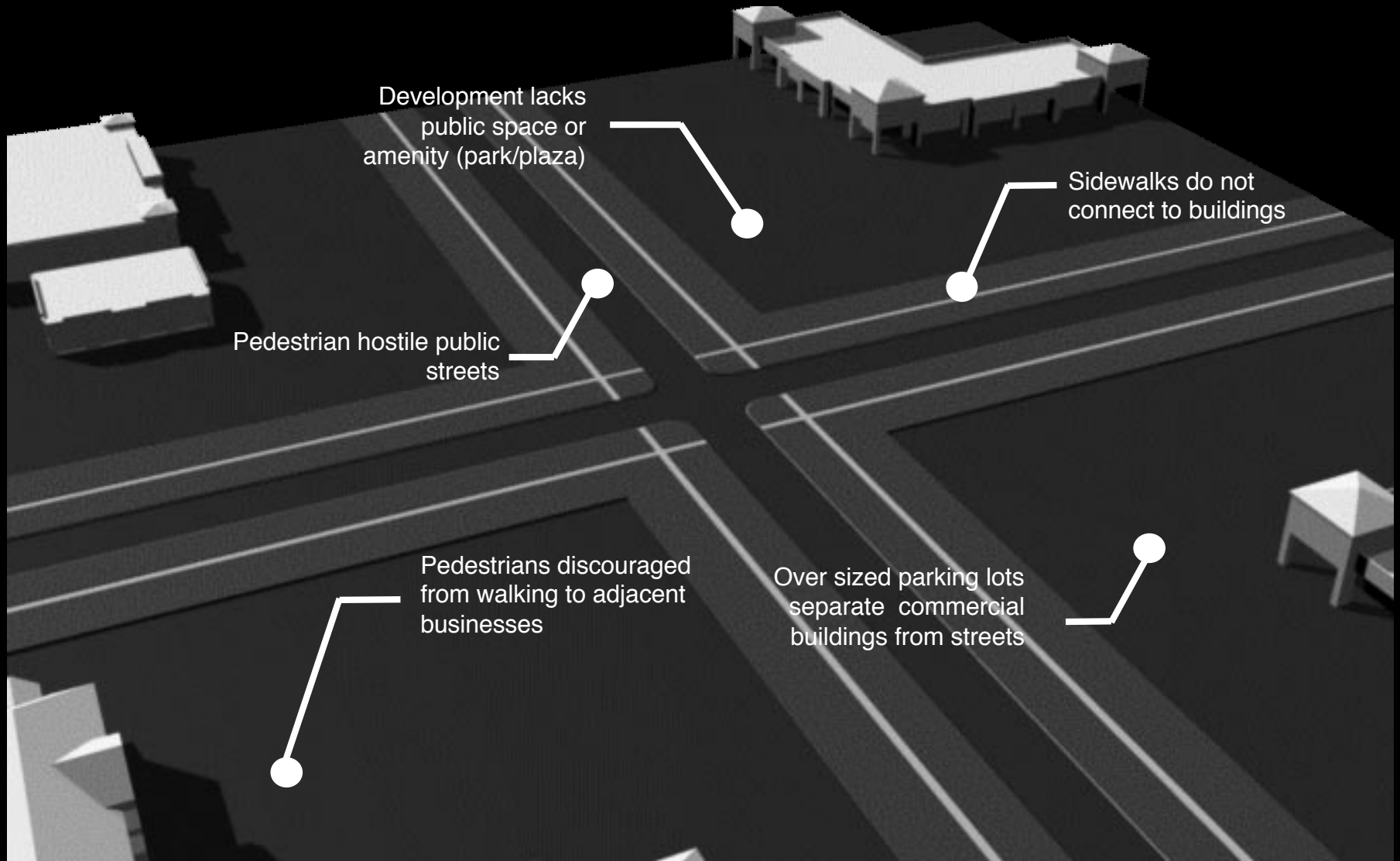




Streets and Building Orientation

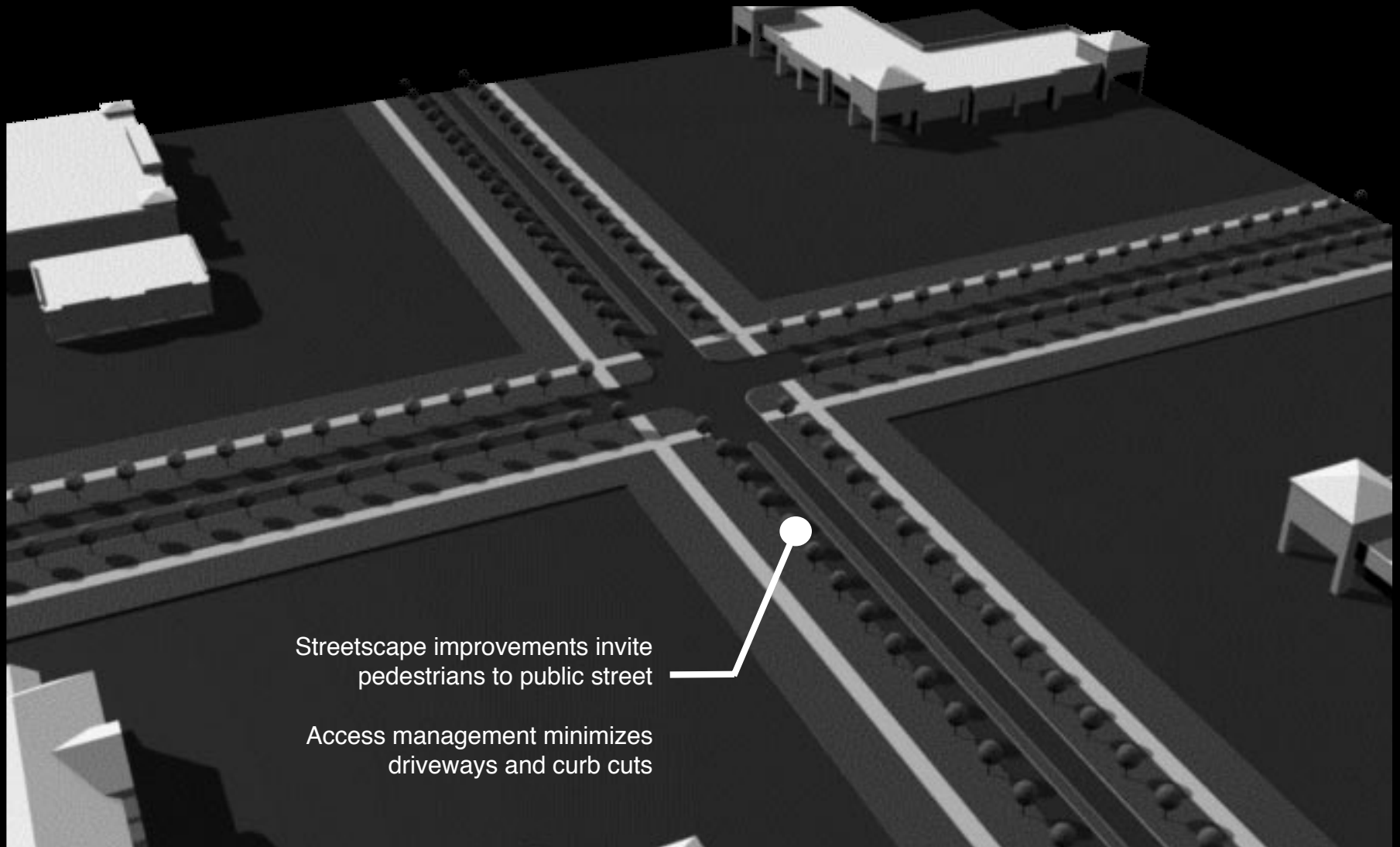
Transit service ineffective
(Buildings too far from street, results
long walks and inefficient routing)

Typical conditions



Orient Building to the Street

Public investment



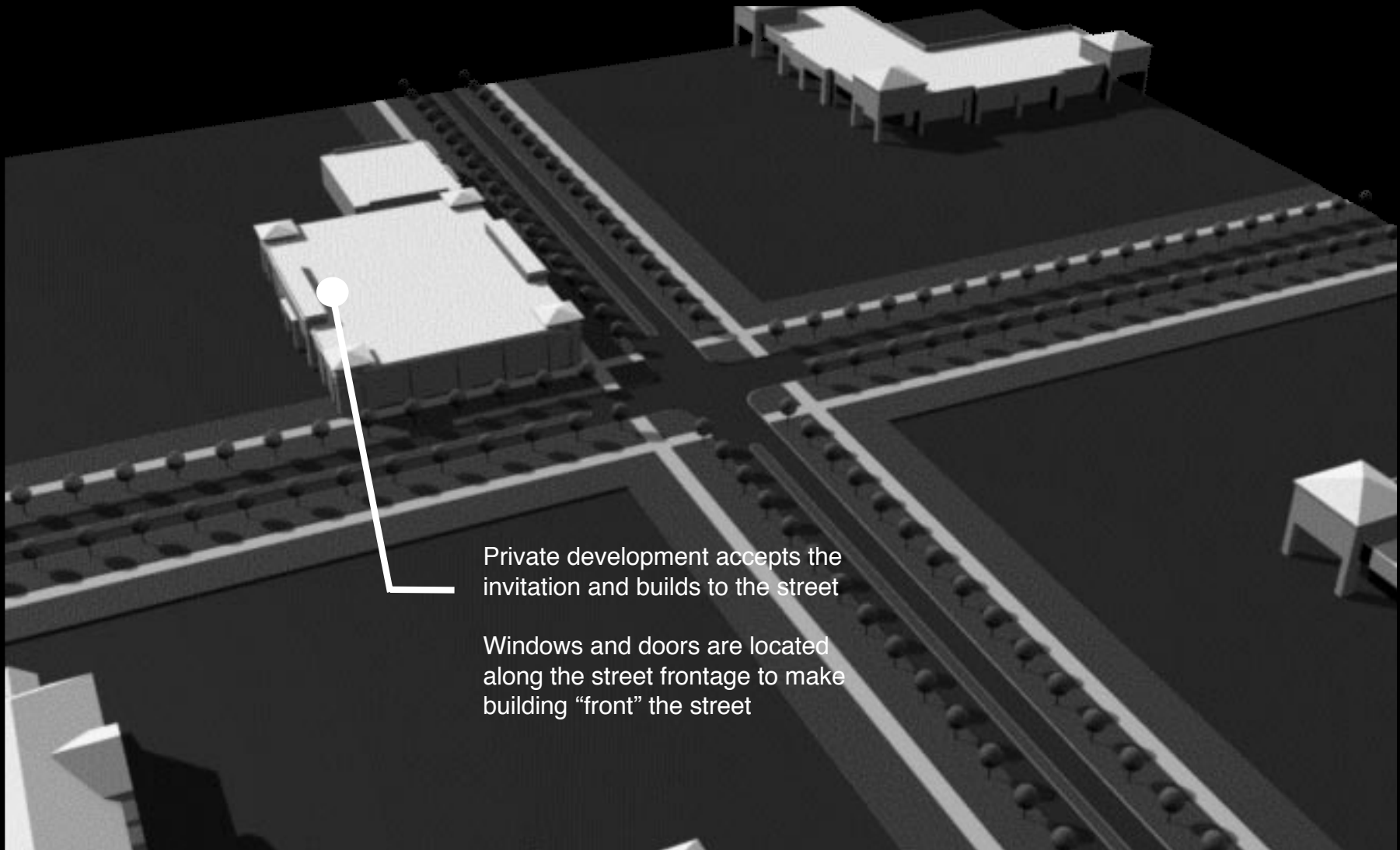
Streetscape improvements invite
pedestrians to public street

Access management minimizes
driveways and curb cuts

Create walkable neighborhoods

Orient Building to the Street

Street oriented development



Private development accepts the invitation and builds to the street

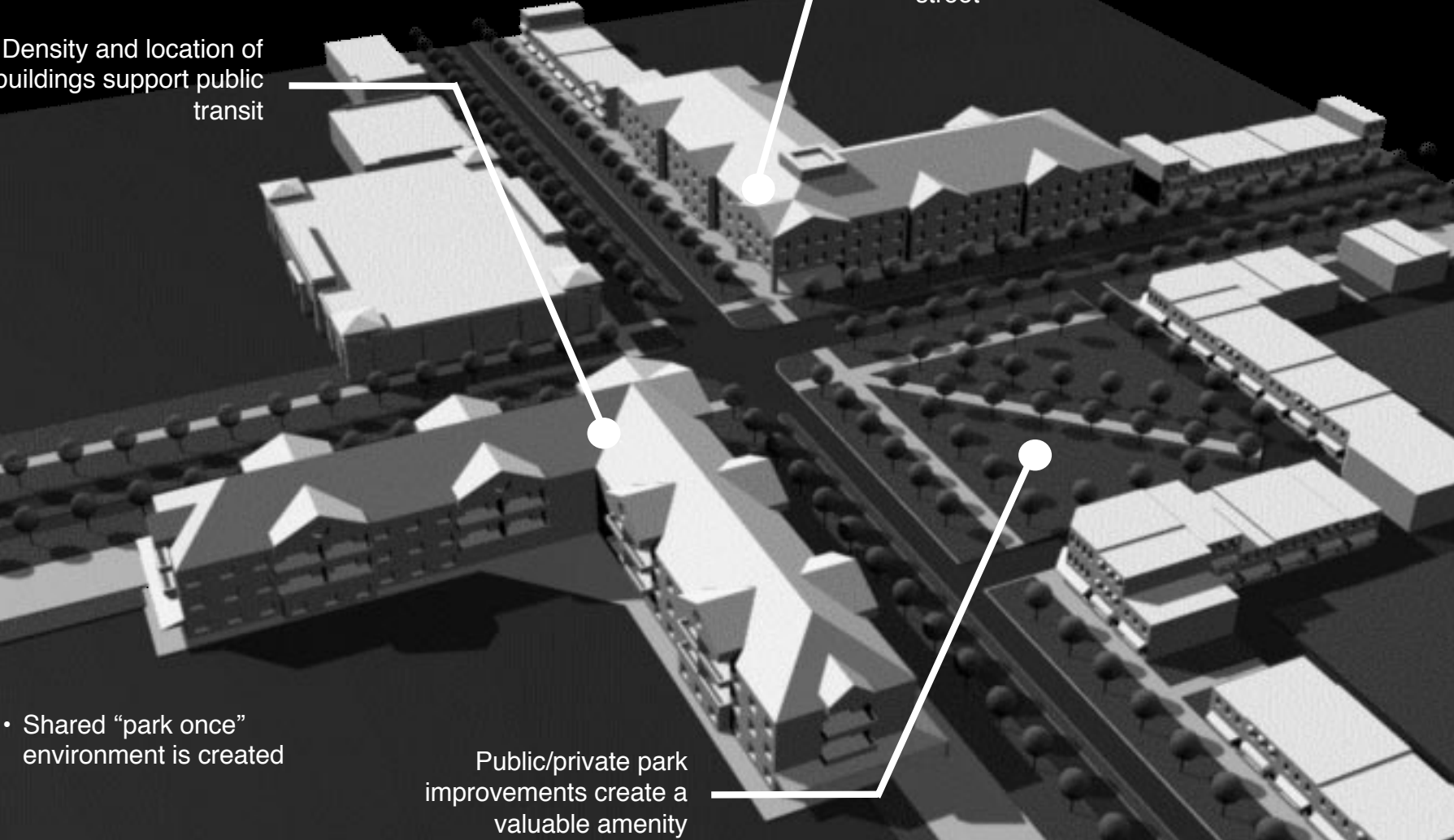
Windows and doors are located along the street frontage to make building "front" the street

Orient Building to the Street

Public park and continued street orientation

New development continues to build to the street

Density and location of buildings support public transit



- Shared “park once” environment is created

Public/private park improvements create a valuable amenity

Create walkable neighborhoods

Supply and Demand



WICKS
P HEAT
3, TAKE
LEAD

LAZERS FINISH
 (NS, NBA, 1, 12C

JR. ROARS
 RAND PRDX
 CYCLE SCENE 13C

USA TODAY

NO. 1 IN THE USA . . . FIRST IN DAILY READERS

MEET USA TODAY'S
H.S. ACADEMIC
ALL-STARS 1,6-7D



THURSDAY

COVER STORY

Grab your coffee for an earlier morning rush

By Scott Swales
 USA TODAY

Shove before have so many drivers been on the road so early. Gridlock is creeping into the pre-dawn hours on both. It says, "begin to move cities as early as 5 a.m. More than 10% of the nation's morning commuters leave the week between 5 and 6 a.m., the largest percentage ever, according to a USA TODAY analysis of the Bureau of Transportation statistics. By some estimates, more than 12 million motorists are making the morning drive before their cars crank up.



5-6 a.m. rush: bumper-to-bumper along the Riverside Freeway toward Los Angeles.

"The word to remedy the morning rush

hour at 7 a.m. to 9 a.m.," Tullian traffic engineer Benjamin Harris says. "Now we look at when traffic peaks before dawn."

The new morning rush is especially

"Five years ago I'd leave the house at 5:45 a.m. and maybe I'd see another car or two, but the road was there," says Paul Sneed, 47, of Columbus, Ohio. "Now I see headlights after breakfast."

Among forces driving the trend:

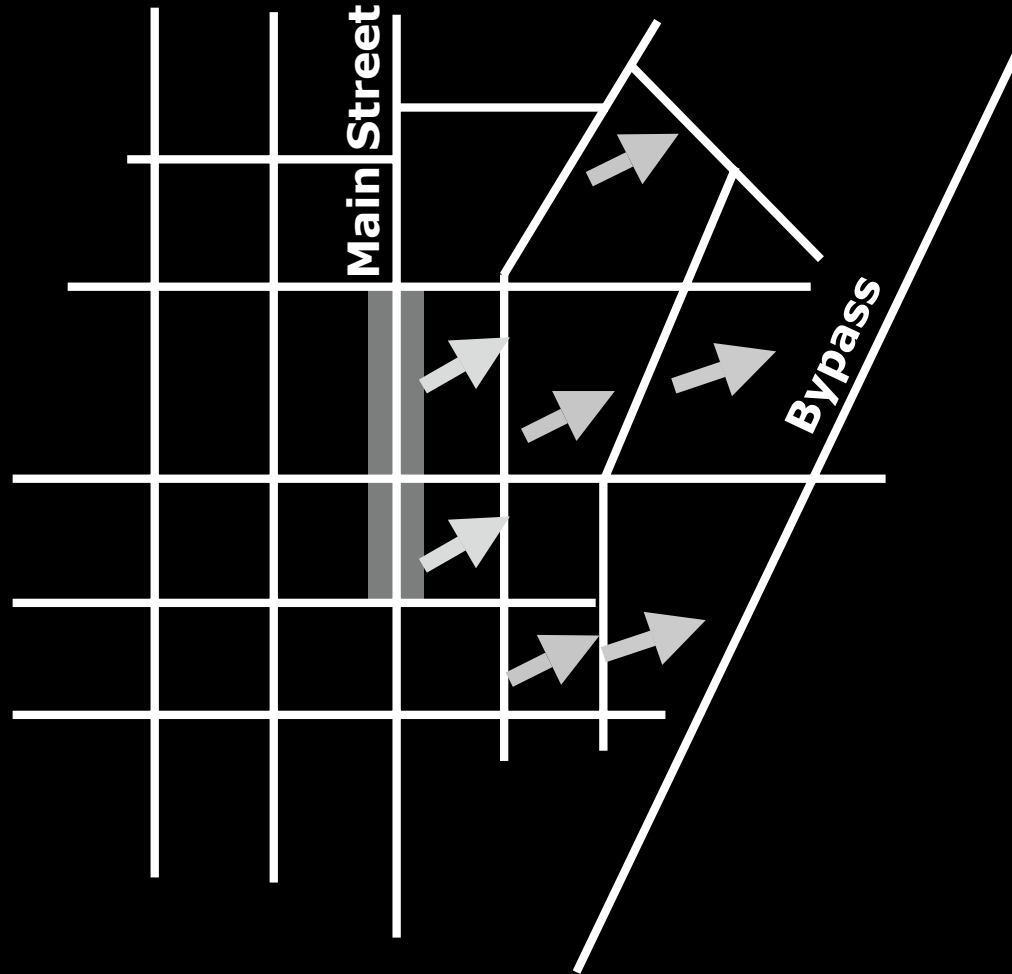
- More drivers on the road. A booming economy has created the nation's largest workforce. More workers mean more commuters. A surging computer industry, especially, has created a workforce of millions who go to work early in the morning with people at home zones around the globe.
- More time spent on the road.

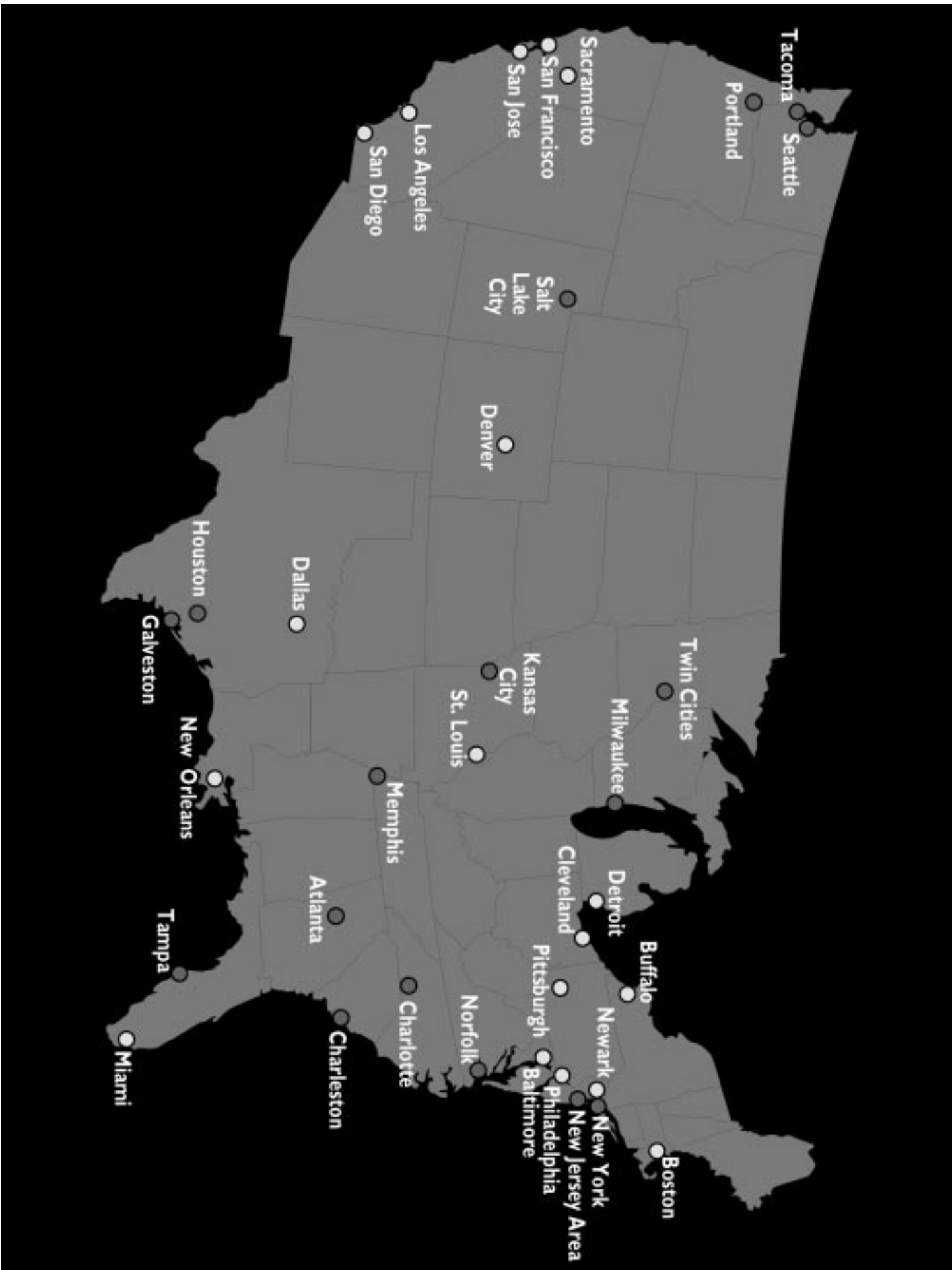
See COVER STORY's next page ►

Secretary secretary 1B
 Normine Summers' new challenge, 1,2B
 Strong economy best politics, 3B

Senate: No to

Rerouting "Chain Reaction"







**When you have eliminated
the impossible,
whatever remains,
however improbable,
must be the truth.**

— Sir Arthur Conan Doyle



NEIGHBORHOOD
MARKETS

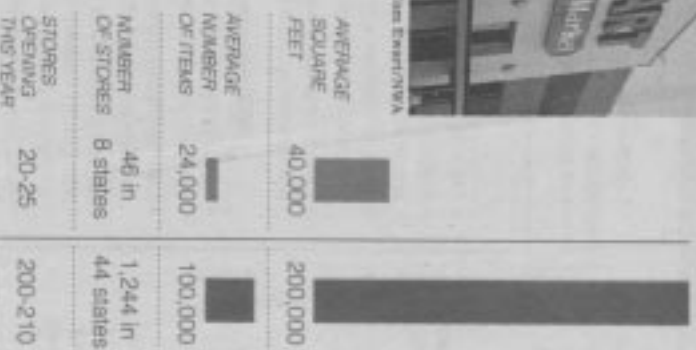


Tommy Exner/TSA

For America's Big Retailers, Small Is Beautiful, Sometimes

How Wal-Mart Became Small-Mart

Pushed by smaller rivals, Wal-Mart created Neighborhood Markets to offer more convenient shopping to those too rushed or too wary to roam the much larger Wal-Mart stores.



Source: Wal-Mart

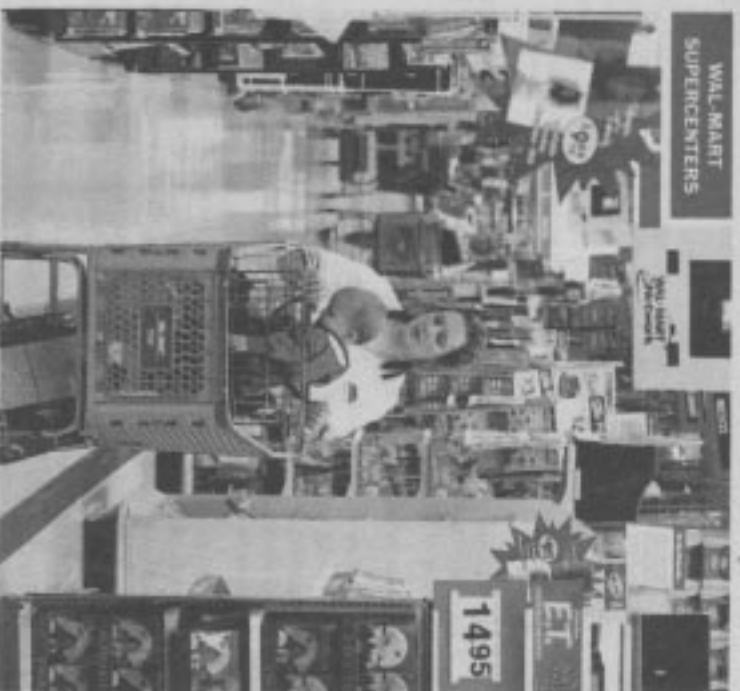
The New York Times

By **CONSTANCE L. HAYS**

After carpeting the country with stores measuring 150,000 square feet or more, retailers are discovering that people do not always have the time or the inclination to get all the way through them.

Yes, the abundance of a 200,000-square-foot Wal-Mart Supercenter is impressive: the equivalent of four football fields of stuff. And sure, it's handy to be able to buy just about everything at a single 175,000-square-foot SuperTarget. But at the same time, time-pressed shoppers, particularly millions of aging baby boomers, are sometimes finding these stores to be too large, too inconvenient and too tiring to get all the way through.

And the big-box retailers have noticed. Wal-Mart Stores has been aggressively opening scaled-down versions of its Super-



Blair/Brett News

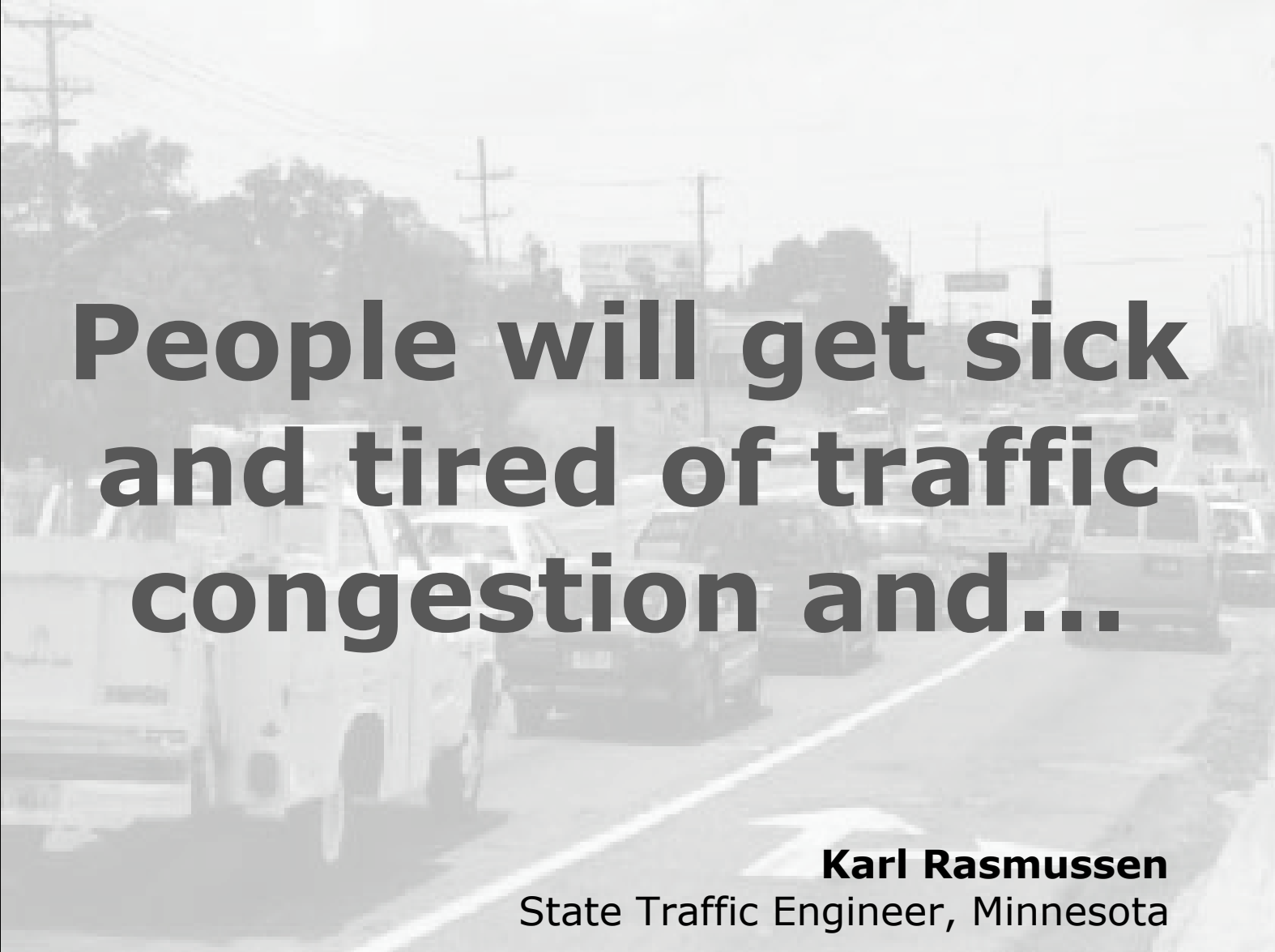
centers — less than one-quarter their size — called Neighborhood Markets. So far the company has built 46 smaller stores scattered through Oklahoma, Arkansas, Texas, Mississippi and Tennessee; a handful opened in Florida, Alabama and Utah in the past week. Retail analysts have taken to calling them Small-Marts.

In Brooklyn, Home Depot has opened a slimmer version of its usual model. Other retailers, including Toys "R" Us and Staples are retrofitting stores to make them smaller, cozier and more intimate, qualities the big-box format was supposed to displace.

"Customers are demanding respect for their time," said David M. Szymanski, director of the Center for Retailing Studies at Texas A&M University. "One way to respond to that is to offer formats that cater to that."

Leisa Still suffers at times from big-store fatigue. Ms. Still,





**People will get sick
and tired of traffic
congestion and...**

Karl Rasmussen
State Traffic Engineer, Minnesota

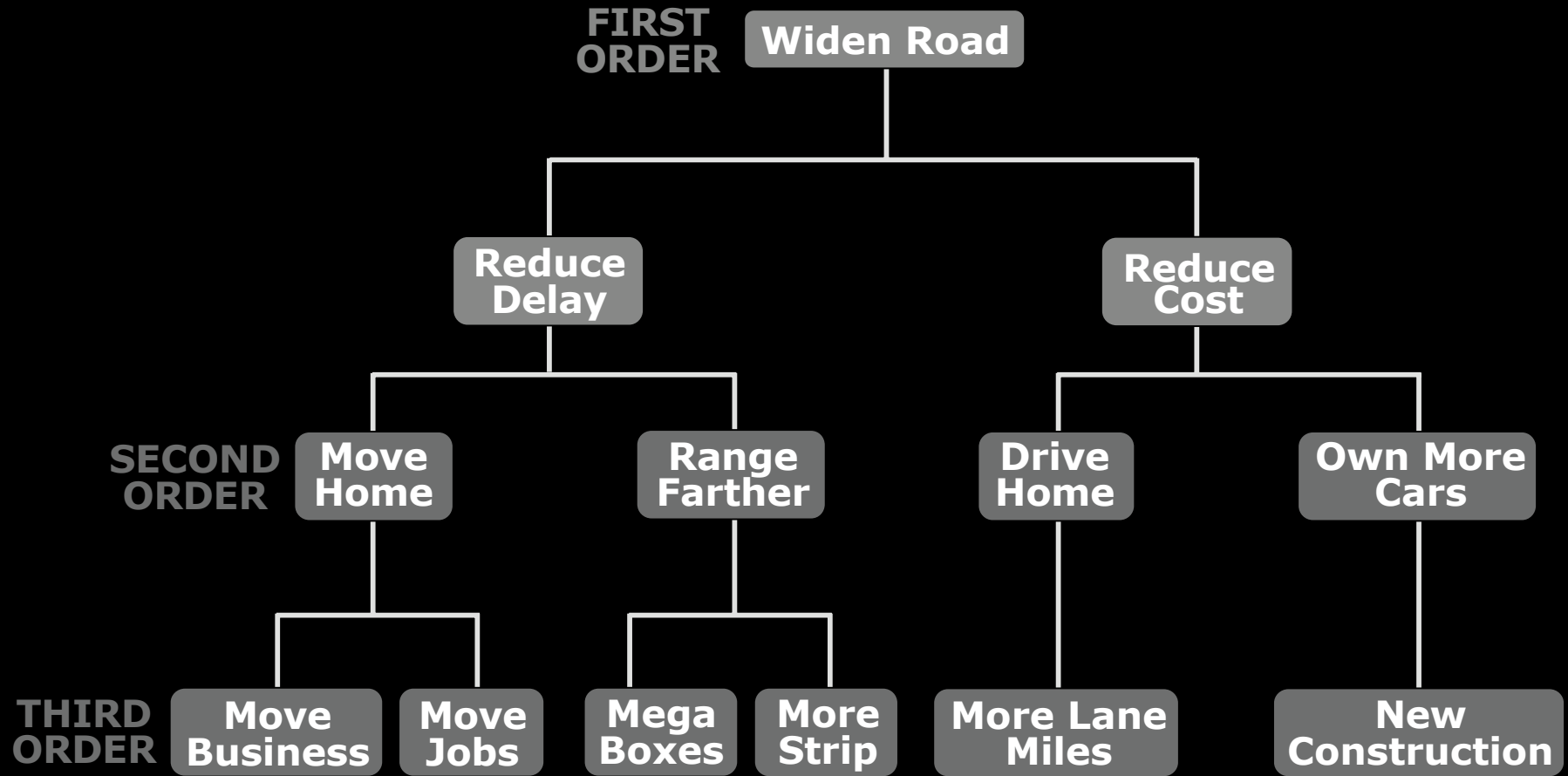


**...and move
into the city.**

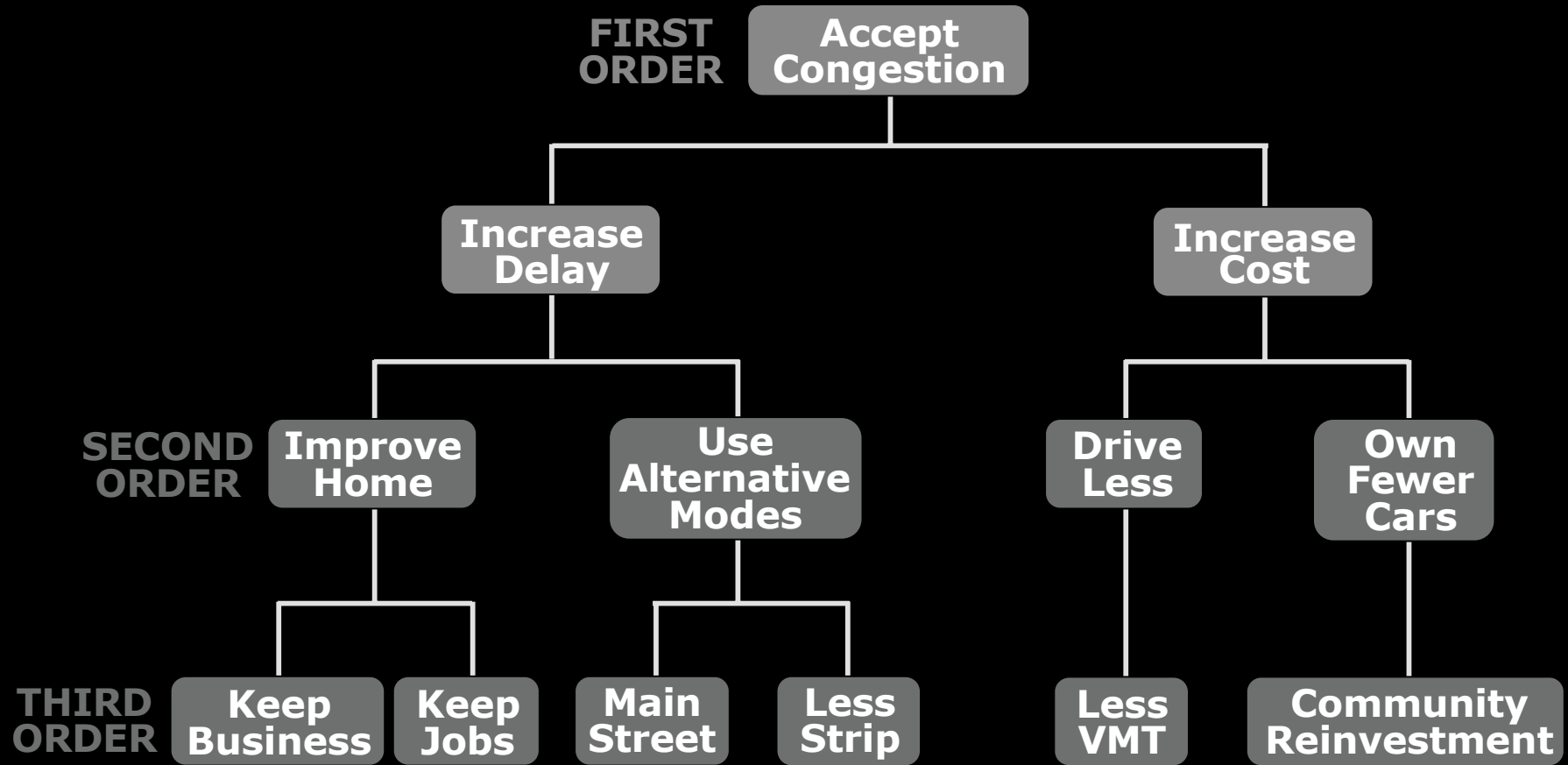
Karl Rasmussen
State Traffic Engineer, Minnesota



Chain of Impacts



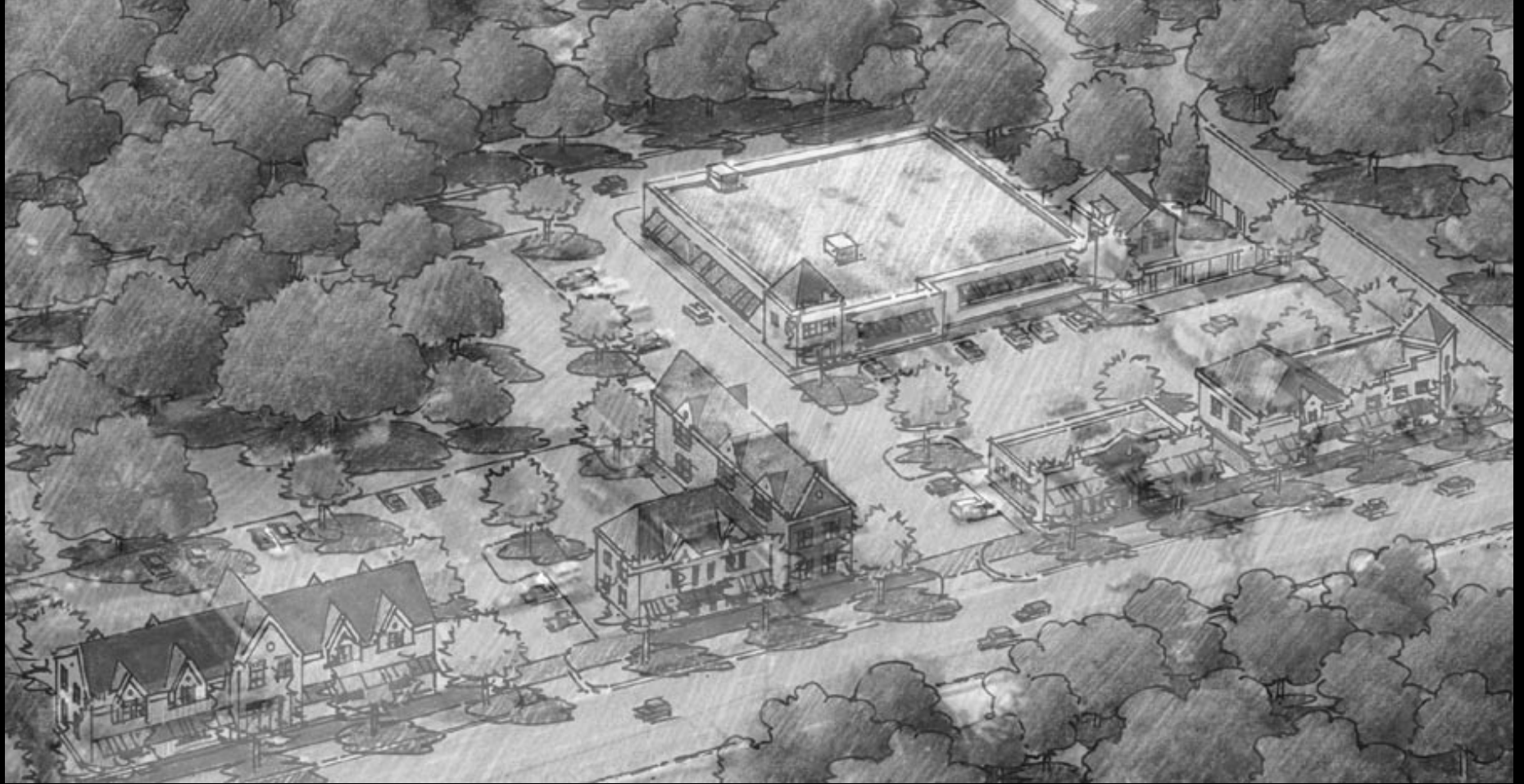
Chain of Impacts



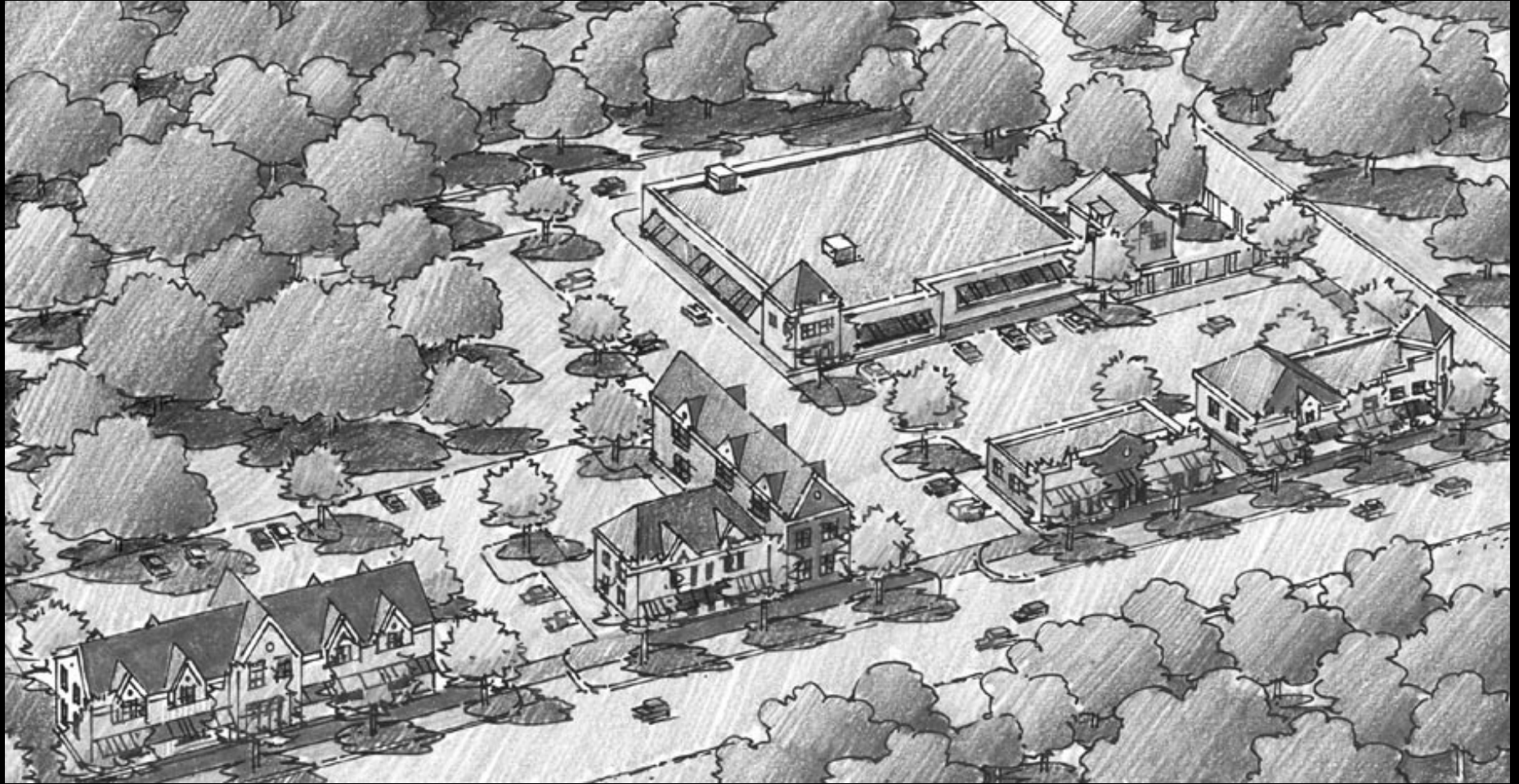
Wilson Farms – Future?



Wilson Farms – Future?



Wilson Farms – Future?



Street Network Creates a Rural Place



Preserve open space and farmland

Street Network Creates a Rural Place

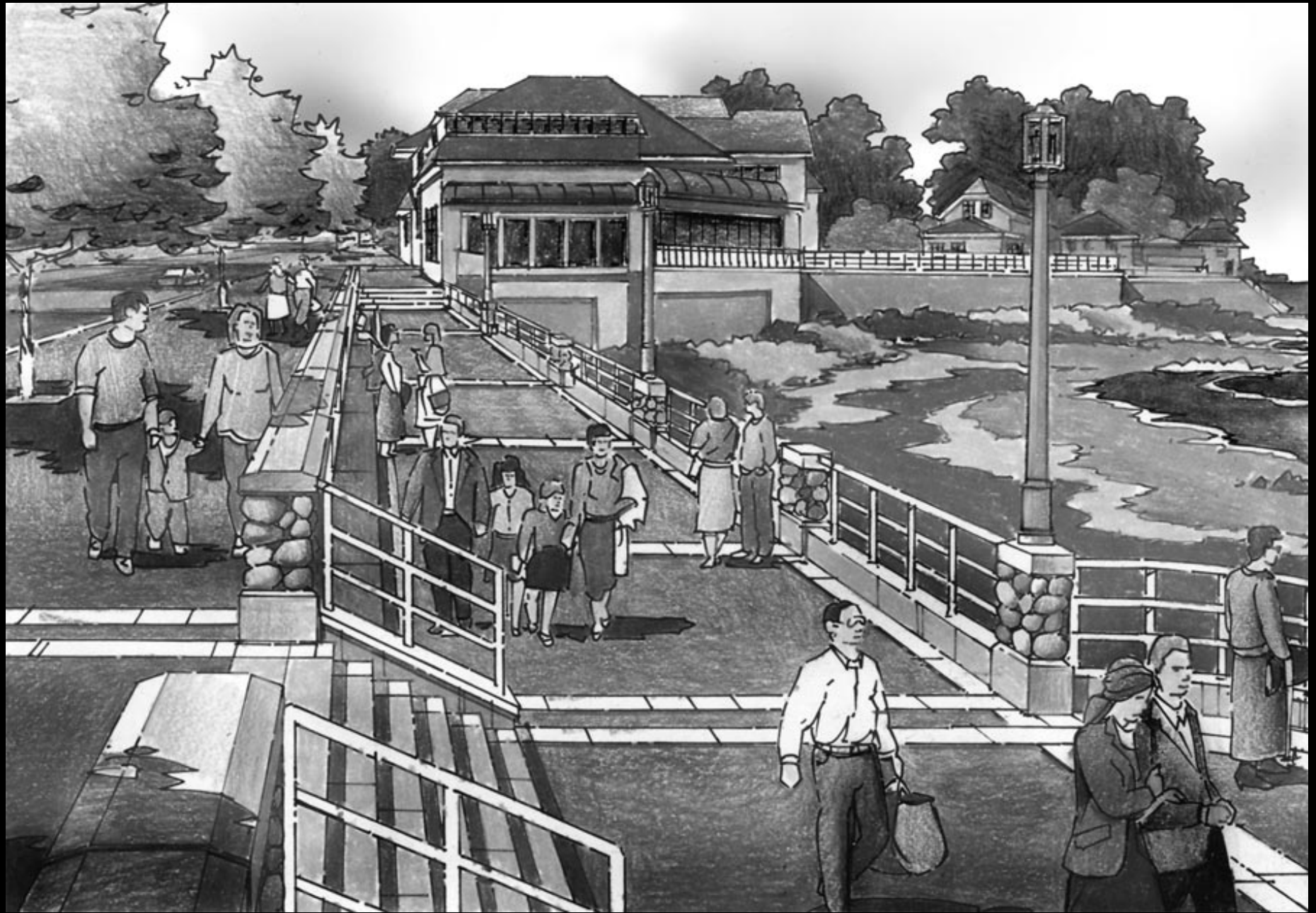


Preserve open space and farmland

Seawall / Army Corps Project



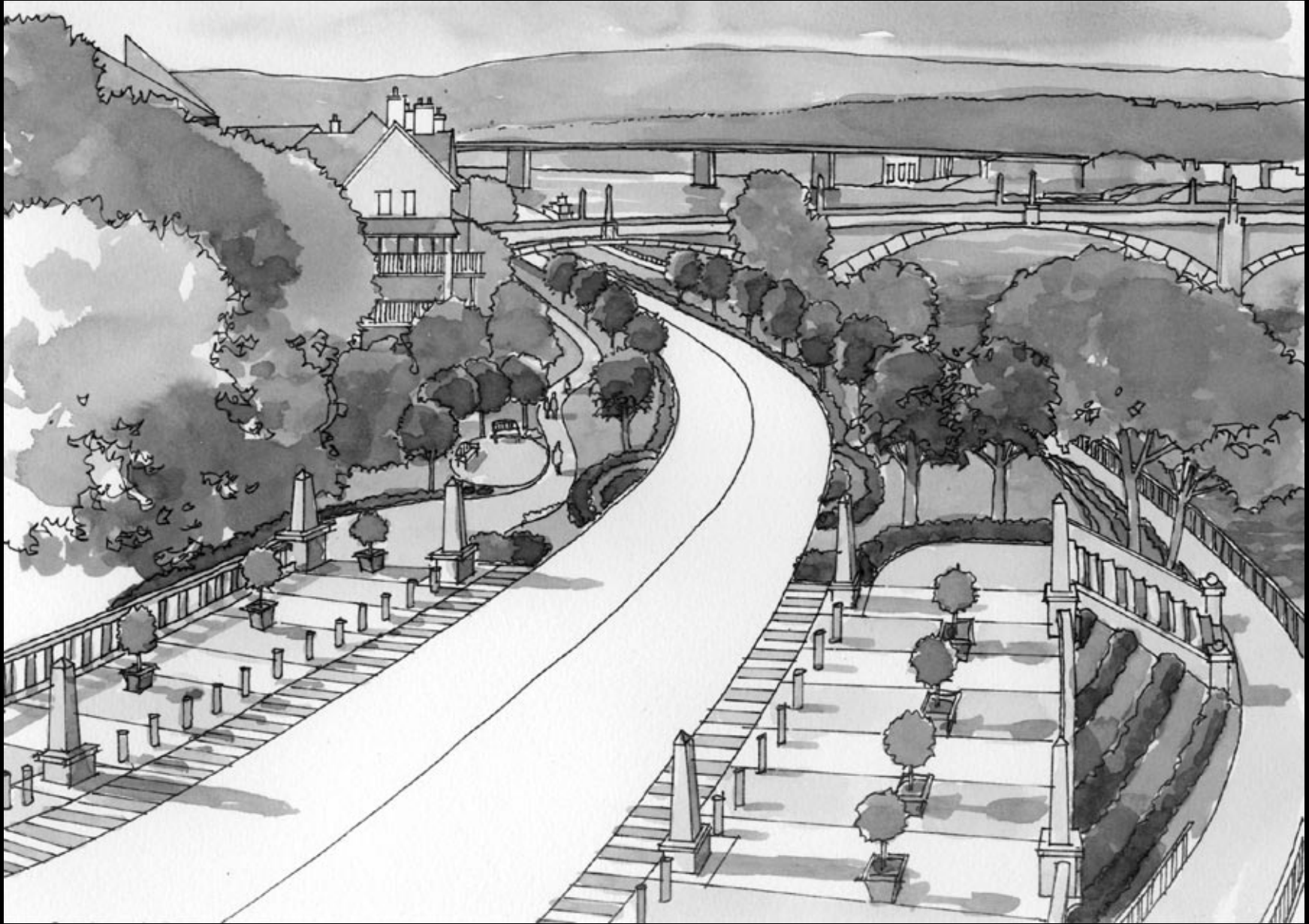
Seawall / Army Corps Project



Waterfront Highway Cuts Off City



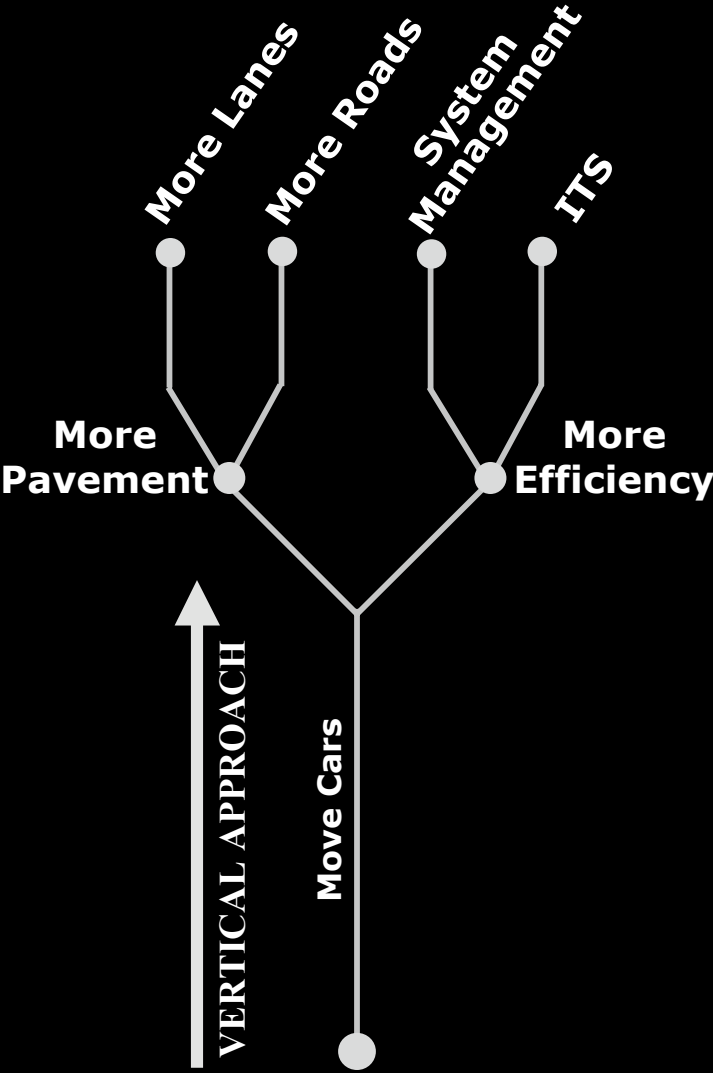
Road Diet Concept



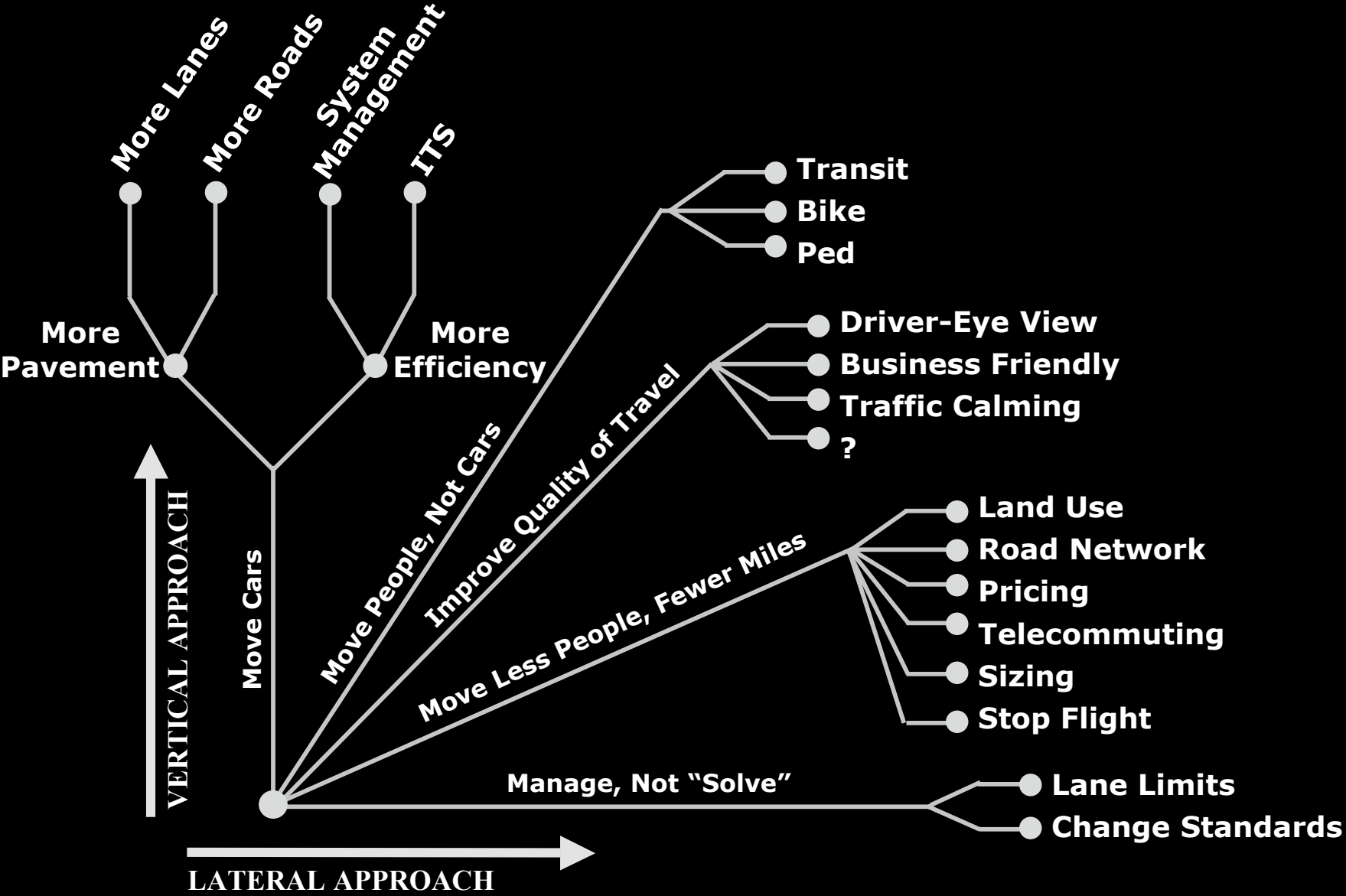
Construction Underway



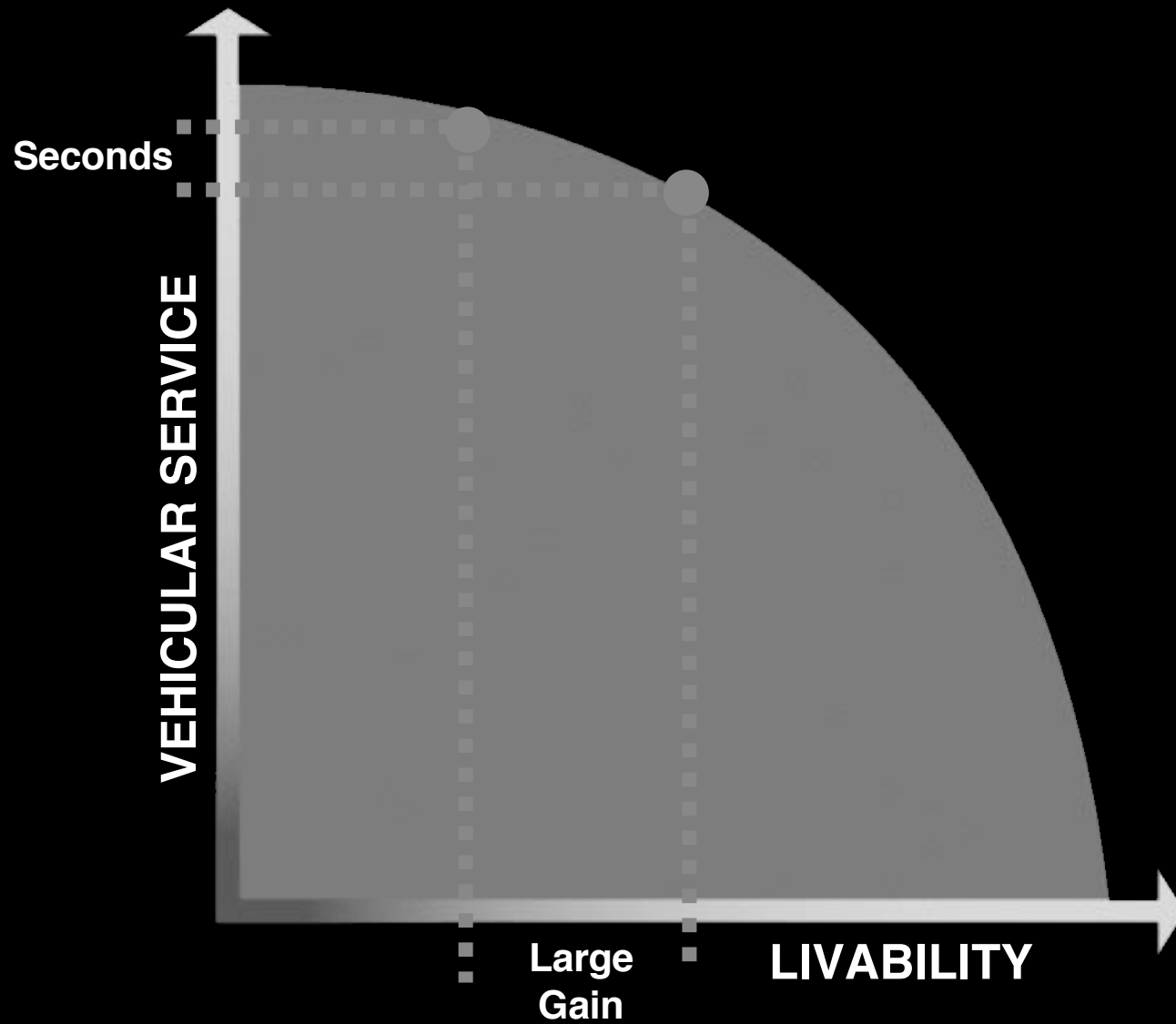
Transportation Principles



Transportation Principles



Transportation Options and Community Livability





**" America, a nation that flourished
from 1900-1942, conceived many odd
inventions for getting somewhere, but
could think of nothing to do when they
got there."**

Will Rogers, 1936