
NWA
RAIL
Visioning Rail Transit in Northwest Arkansas:
Lifestyles and Ecologies

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By integrating architecture, landscape and urban design Conway + Schulte Architects strives to create spaces that are inspiring and beneficial to the communities in which they are built as they are to the clients for whom they are built.

Washington University
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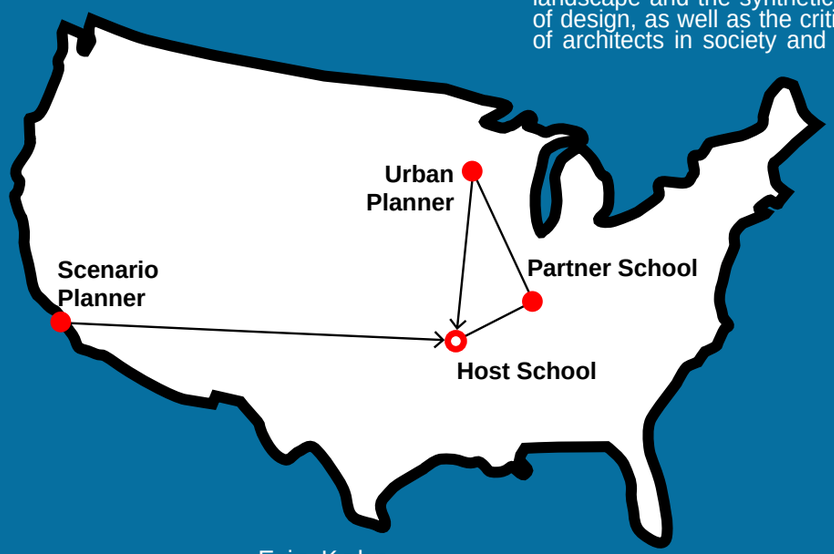
The Graduate School of Architecture & Urban Design involves studios focused on issues of the metropolitan landscape and the synthetic activity of design, as well as the critical role of architects in society and culture.



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COA works to develop synthetic, innovative projects, striving to integrate multiple concerns, including client needs, site opportunities, human factors and technological demands to form a coherent architectural project.

University of Arkansas
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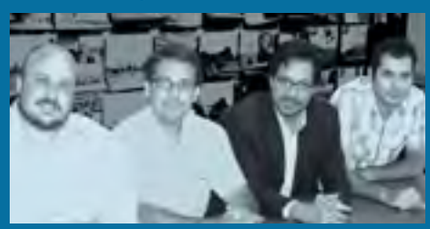
As an outreach center of the School of Architecture, UACDC is developing a repertoire of new design methodologies applicable to community development issues in Arkansas, with currency at the national level.



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outreach center of the
school of architecture

May 21, 2007

Dear Northwest Arkansas:

We hope that you will enjoy reviewing the following study on rail transit as much as our architecture programs at the University of Arkansas and Washington University in St. Louis have enjoyed speculating on the various planning possibilities. Our research shows that Northwest Arkansas (NWA) would be an ideal candidate for federal funding to study rail transit feasibility.

Some say that the idea of rail transit in NWA is outlandish: that folks here would never leave their cars to ride trains. Similar observations were voiced about nearby Dallas more than two decades ago. Now its rail transit system, DART, is considered to be one of the finest nationwide. Over the past ten years alone, DART has generated more than $1 billion in mixed-use, high quality urban development—much of it unexpected. Now, the planning industry understands that well-planned rail transit not only mitigates seemingly intractable traffic problems, but also promotes desirable economic development. Indeed, over 60 regions, large and small, participate in the federal “New Start” program, obtaining assistance for rail transit development. Will lack of planning foresight compromise the economic sustainability of NWA when compared to peer regions?

Others in leadership positions will contend that while rail transit is a good idea, it is not yet feasible for NWA. However, the traditional calculus of feasibility for rail transit has changed as less populated regions are making rail transit work. As a growing region (with the population doubling in only 15 years), we must keep in mind that NWA was historically a rail transit region. Future trends indicate that the smart money will reward those regions that have developed “green” energy systems and efficient transportation. Since Arkansas is a leader in the logistics industry why not shift traffic demand from highways to a resuscitated rail asset, opening more highway capacity to trucking without costly new road construction?

This book, however, is not just about enhancing transportation networks, but more importantly, imagining new development forms, links, and variations on life in NWA. The greatest challenge is the cultivation of imaginative political and business leadership willing to “future” different development scenarios for our region. Enjoy the book NWA, and consider a future where we could become a national model for smart growth.

Sincerely,
The Rail Transit Design Studio

“The new mobility culture considers not only transit but also health, education, housing, waste, and social needs. No transportation system is an island; it must coordinate all shared systems for maximum effect.”

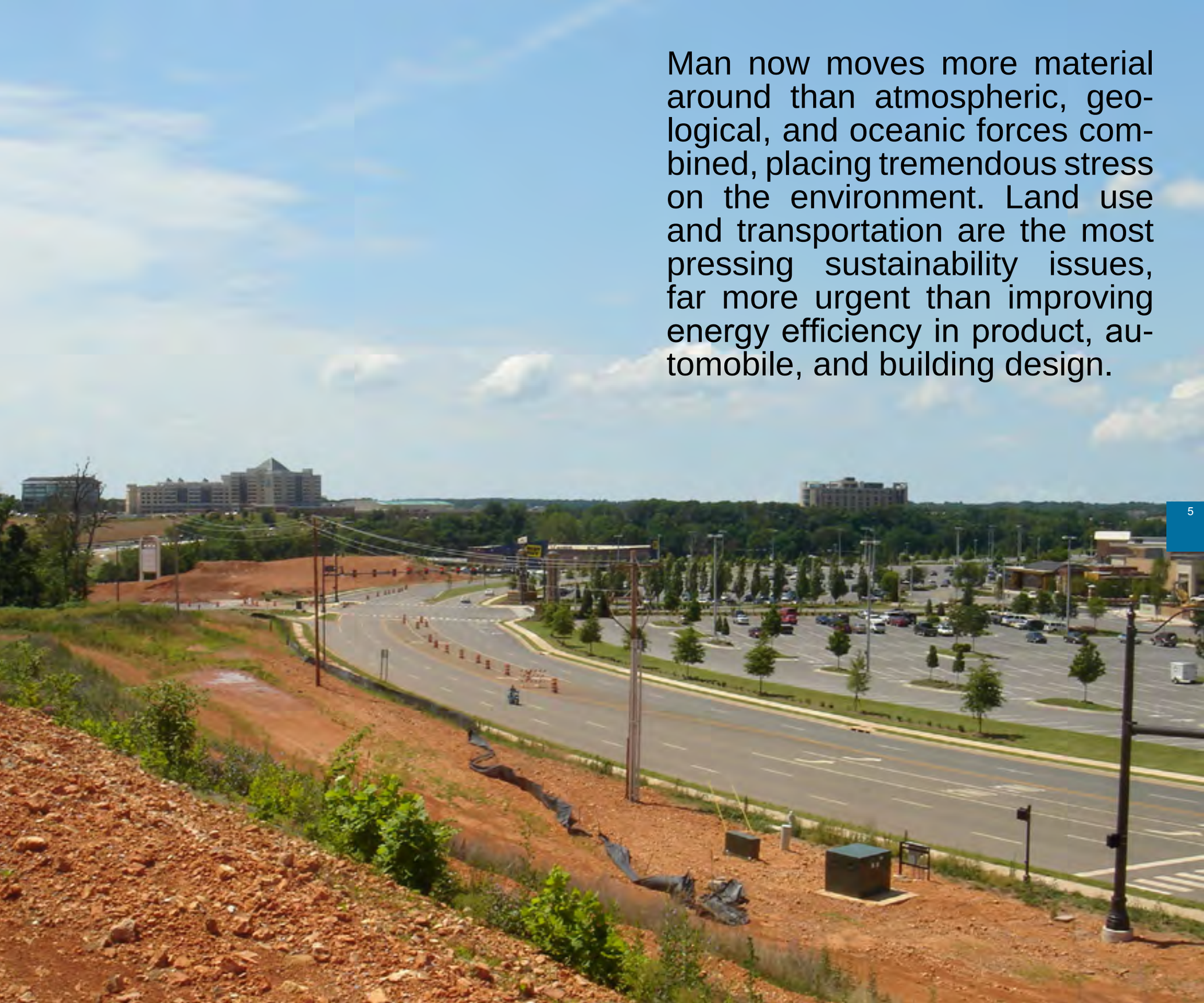
Bruce Mau, *et al.*, *Massive Change*

“We cannot talk about urban transport until we know what type of city we want. How do we want to live? Do we want to create a city for humans or a city for automobiles? The important questions are not about engineering, but about ways to live.”

Enrique Penalosa, former Mayor of Bogota, Colombia in *Massive Change*

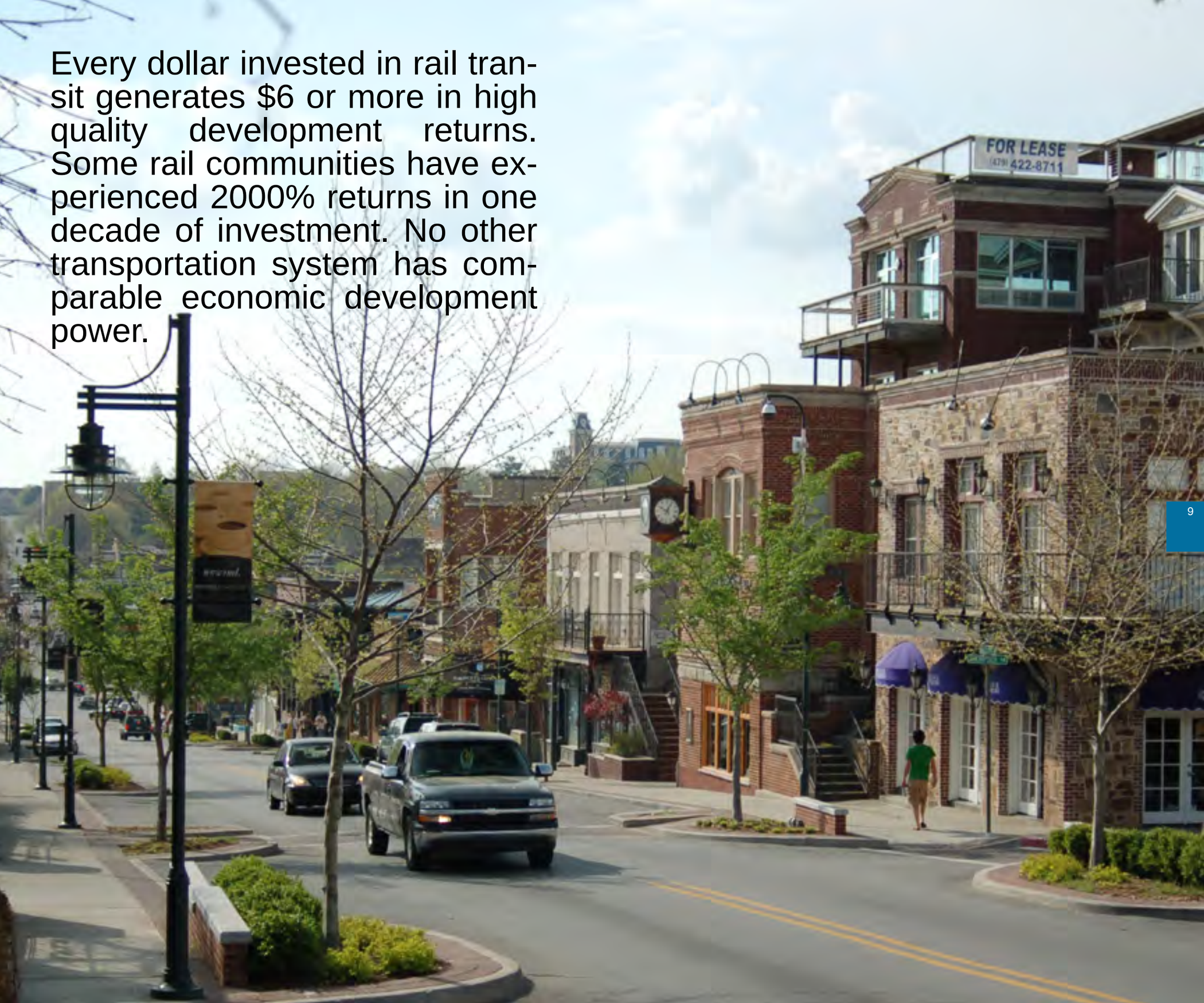
welcome to Northwest Arkansas

Man now moves more material around than atmospheric, geological, and oceanic forces combined, placing tremendous stress on the environment. Land use and transportation are the most pressing sustainability issues, far more urgent than improving energy efficiency in product, automobile, and building design.

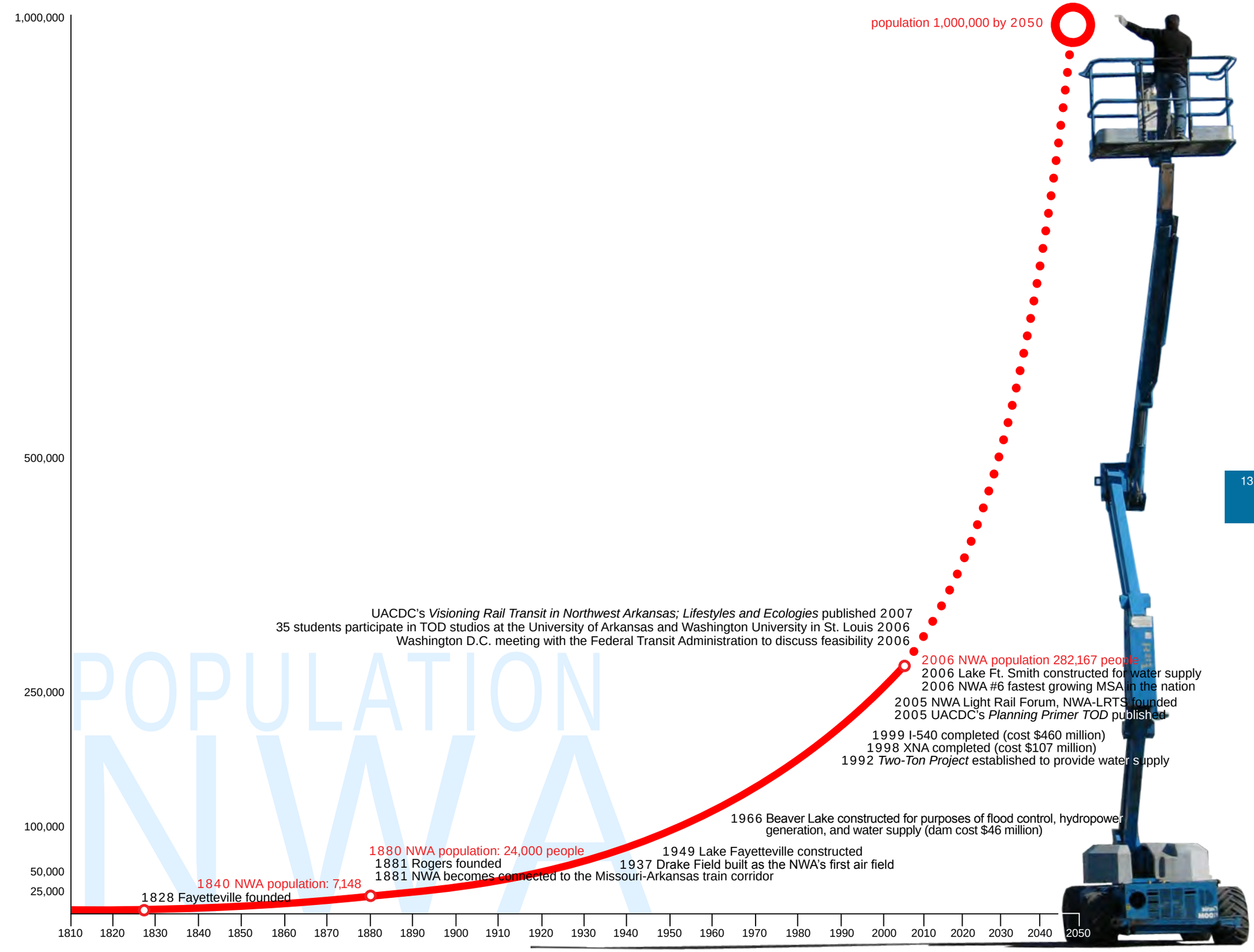


Trends indicate that the smart investment capital will reward regions that have developed “green” energy systems, efficient multimodal transportation, and innovative urban places.

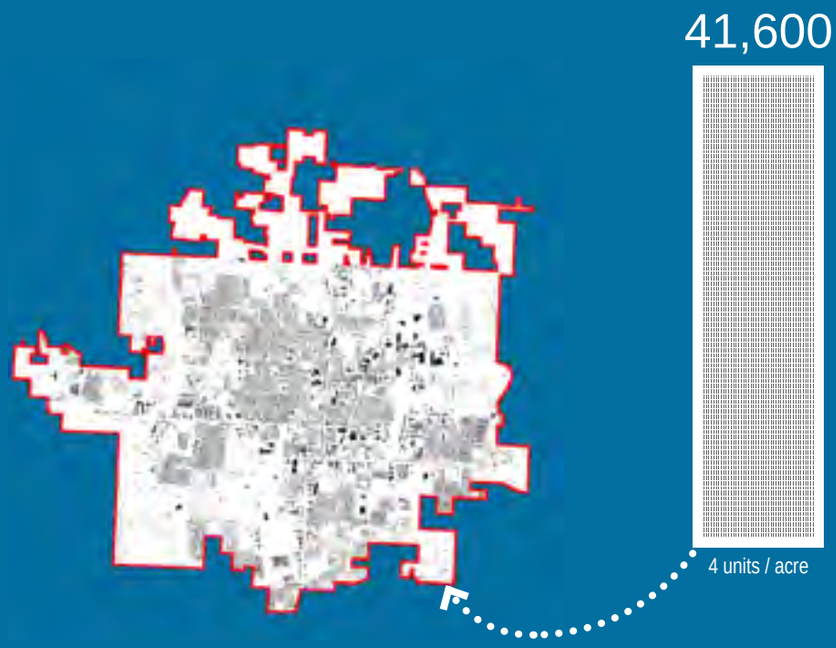
Every dollar invested in rail transit generates $6 or more in high quality development returns. Some rail communities have experienced 2000% returns in one decade of investment. No other transportation system has comparable economic development power.




Bristol
Salon Gifts


1,000,000
500,000
250,000
100,000
50,000
25,000
population 1,000,000 by 2050
UACDC's *Visioning Rail Transit in Northwest Arkansas; Lifestyles and Ecologies* published 2007
35 students participate in TOD studios at the University of Arkansas and Washington University in St. Louis 2006
Washington D.C. meeting with the Federal Transit Administration to discuss feasibility 2006
2006 NWA population 282,167 people
2006 Lake Ft. Smith constructed for water supply
2006 NWA #6 fastest growing MSA in the nation
2005 NWA Light Rail Forum, NWA-LRTS founded
2005 UACDC's *Planning Primer TOD* published
1999 I-540 completed (cost $460 million)
1998 XNA completed (cost $107 million)
1992 *Two-Ton Project* established to provide water supply
1966 Beaver Lake constructed for purposes of flood control, hydropower generation, and water supply (dam cost $46 million)
1880 NWA population: 24,000 people
1881 Rogers founded
1881 NWA becomes connected to the Missouri-Arkansas train corridor
1949 Lake Fayetteville constructed
1937 Drake Field built as the NWA's first air field
1840 NWA population: 7,148
1828 Fayetteville founded
POPULATION
NWA
1810 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020 2030 2040 2050

Bentonville will double its population

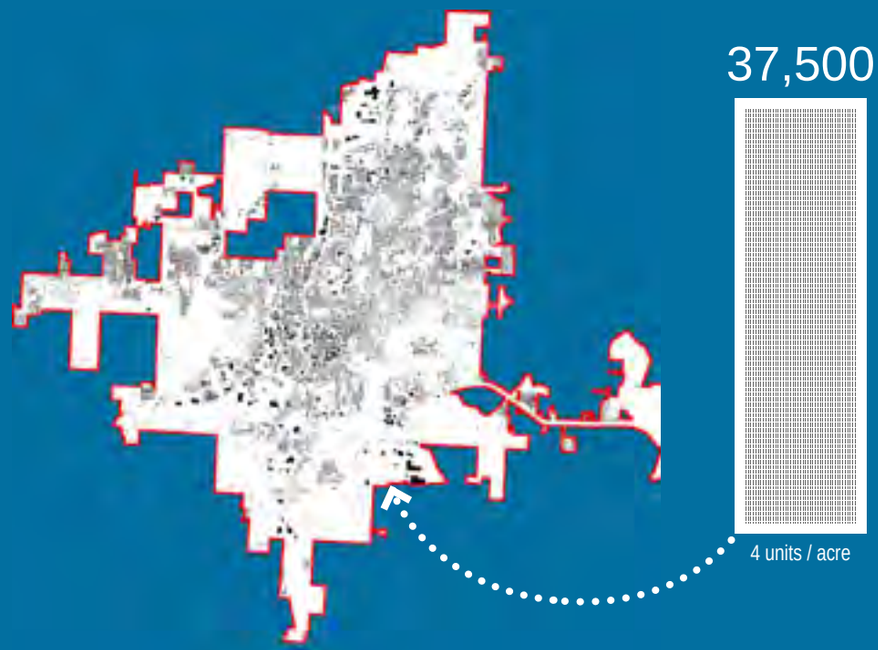


Springdale will triple its population

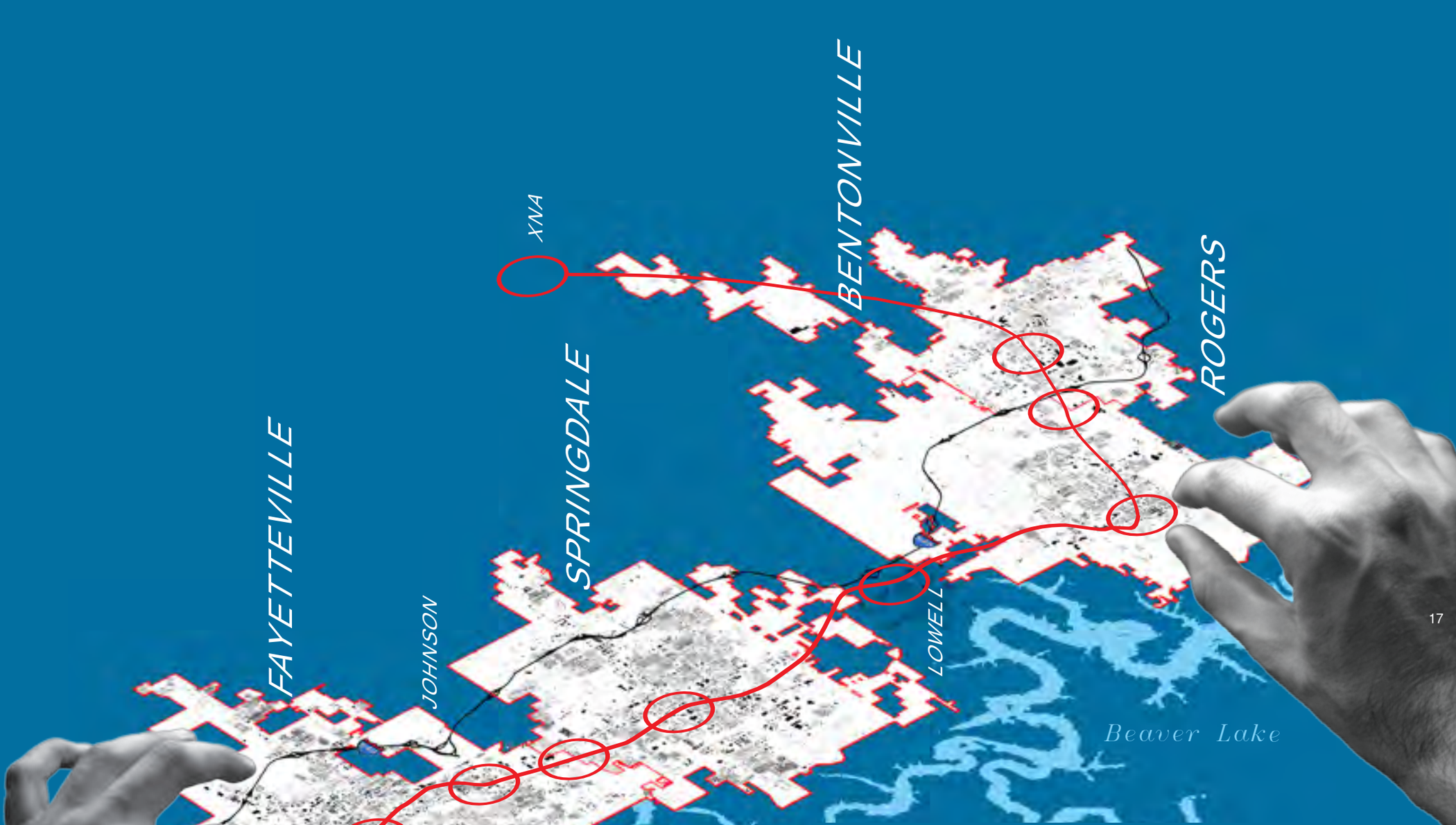
2050: projected housing starts

new footprints do not include all other land uses and infrastructure that support housing

Rogers will triple its population



Fayetteville will double its population



Since NWA is growing rapidly, how might we responsibly urbanize the "Natural State"?

One possible future might include regional light rail. Take a look and see what you think...

re-envision NWA...

from a collection of autonomous cities to a well-connected, interdependent region, serving various travel markets (e.g. commuters, tourists, a traveling business class, students, and zero-car households). Accessible public transit means that each city can cooperatively develop niche services at the scale of the region.

We Are Bentonville!

Crystal Bridges Museum

Farmers Market

Wal-Mart Headquarters

Wal-Mart Historical Museum

We Are Rogers!

Rogers Airport

NWA Community College

Beaver Lake

The Promenade Lifestyle Mall

Pinnacle Hills Development

Northwest Arkansas Regional Airport

We Are Springdale!

We Are Lowell!

Minor League Baseball Stadium

Springdale Airport

Rodeo of the Ozarks

Jones Family Center

Tyson Headquarters

J.B. Hunt Headquarters

NWA Regional Medical Center

NWA Regional Mall

University of Arkansas

student pop. 18,000

Dickson Street

Walton Performing Arts Center

Farmers Market

Razorback Athletic Valley

We Are Fayetteville!

Drake Field Airport

We Are Northwest Arkansas!

the nation's 6th fastest growing region

Crystal Bridges Museum

BENTONVILLE

Wal-Mart Historical Museum

Farmers Market

Wal-Mart Headquarters

NWA Community College

NWACC

Bentonville Airport

Rogers Airport

ROGERS

Beaver Lake

The Promenade Lifestyle Mall

Pinnacle Hills Development

J.B. Hunt Headquarters

XNA

Northwest Arkansas Regional Airport

LOWELL

EMMA AVENUE

Jones Family Center

Springdale Airport

Rodeo of the Ozarks

The Naturals Minor League Baseball Stadium

Tyson Headquarters

JOHNSON

NWA MALL

NWA Regional Mall

NWA Regional Medical Center

DICKSON STREET

University of Arkansas

Walton Performing Arts Center

Farmers Market

Razorback Stadium

Ozark Plateau

DRAKE FIELD

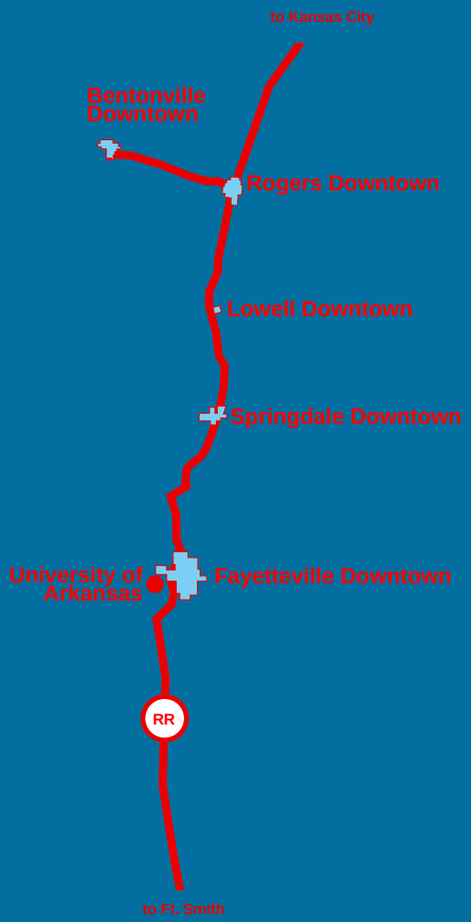
Drake Field Airport

North 0 1 mile

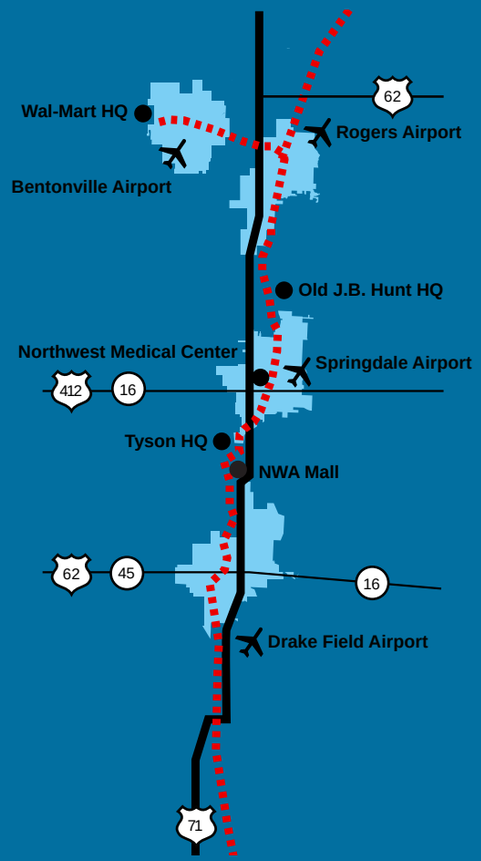
retool NWA...

integrating existing transportation systems before leapfrogging them with new systems. Redundancy will amplify efficiencies in each mode of transportation.

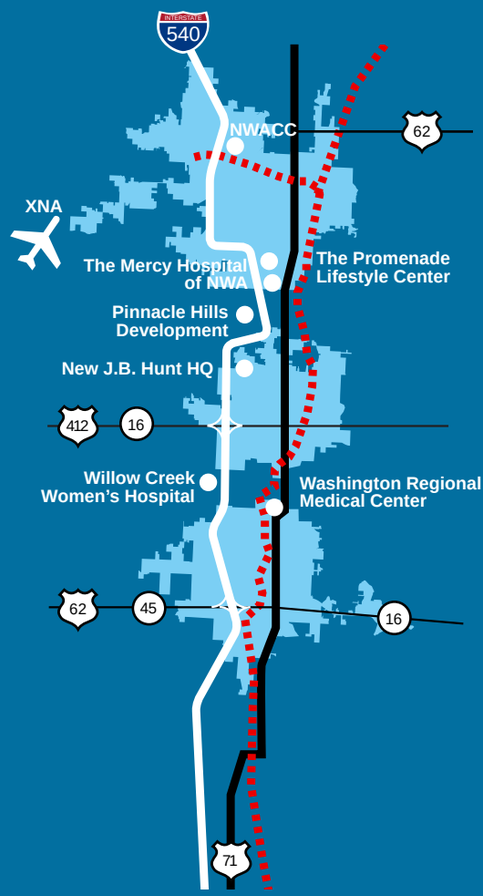
Due to historic railroad development, two-thirds of today's NWA population live within one mile of the rail right-of-way.



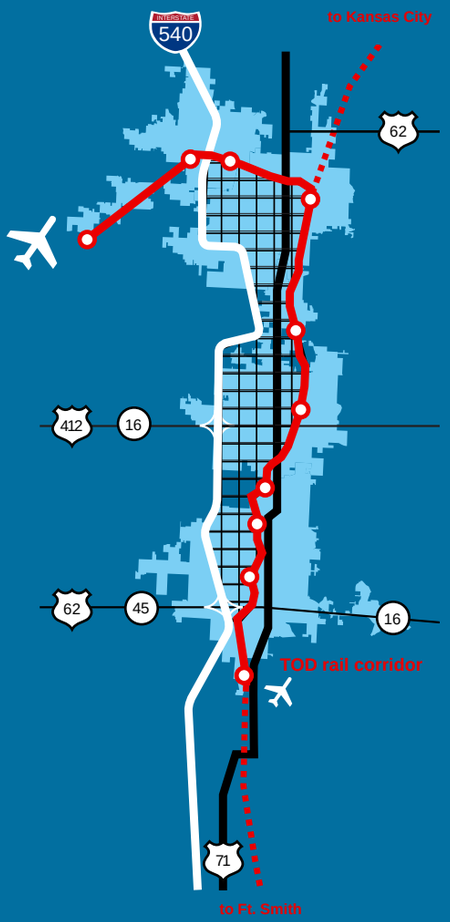
NWA
1900
Rail



NWA
1960
Highway

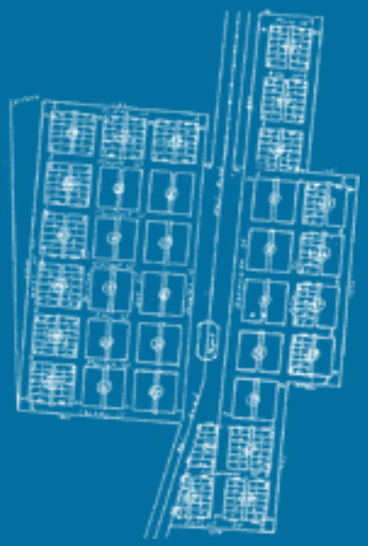


NWA
2000
Interstate



NWA
future
Integrated Transportation

North 0 3 miles



The first plat of 15 blocks in Rogers, dated 1881 and laid out for S.T. Arkansas and Texas R.R. Co.

Bentonville 1914

"On May 10, 1881, occurring almost simultaneously with the inaugural run of the Frisco (St. Louis & San Francisco Railroad) on the newly laid tracks in Rogers, the town was named, businesses started, and a structure for governing established. Rogers gave the honor of its name to Captain Charles Warrington Rogers, the general manager of the St. Louis and San Francisco Railroad."

Marilyn Collins, *Rogers: The Town the Frisco Built*

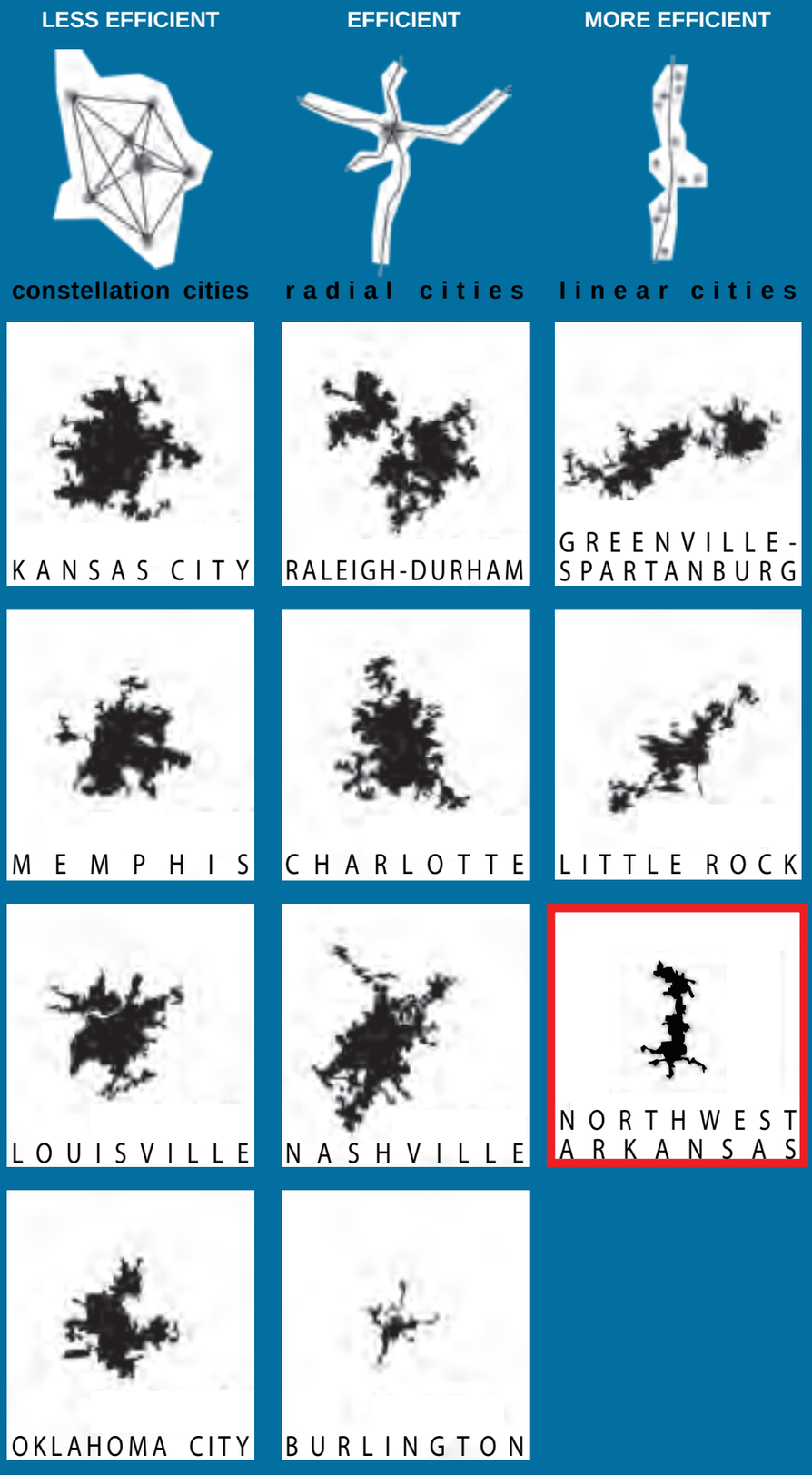
NWA is a historic rail region

Due to historic railroad development, two-thirds of today's NWA population live within one mile of the rail right-of-way. The rail is currently an underutilized regional resource.

The development of the railroad shaped much of the region's economic and cultural geography in the 19th century. Its four major cities, Fayetteville, Springdale, Rogers, and Bentonville were rail communities developed along the still-active Arkansas Missouri Railroad corridor, creating a linear morphology ideal for the renewal of rail transit.

Despite the contemporary prevalence of sprawl development based on single-use zoning, two-thirds of NWA's population and three of its top four employment centers reside within one mile of the rail right-of-way. While historic transit-sensitive land-use patterns and building fabrics remain intact throughout these four downtowns, such accessible land patterns have not influenced contemporary development trends, with the exception of Fayetteville.

The region's anchor communities, Bentonville and Fayetteville, are in the process of adopting downtown masterplans, prompting greater housing densities, compact and mixed-use land development, and pedestrian-oriented environments—in short, accessible land use patterns.

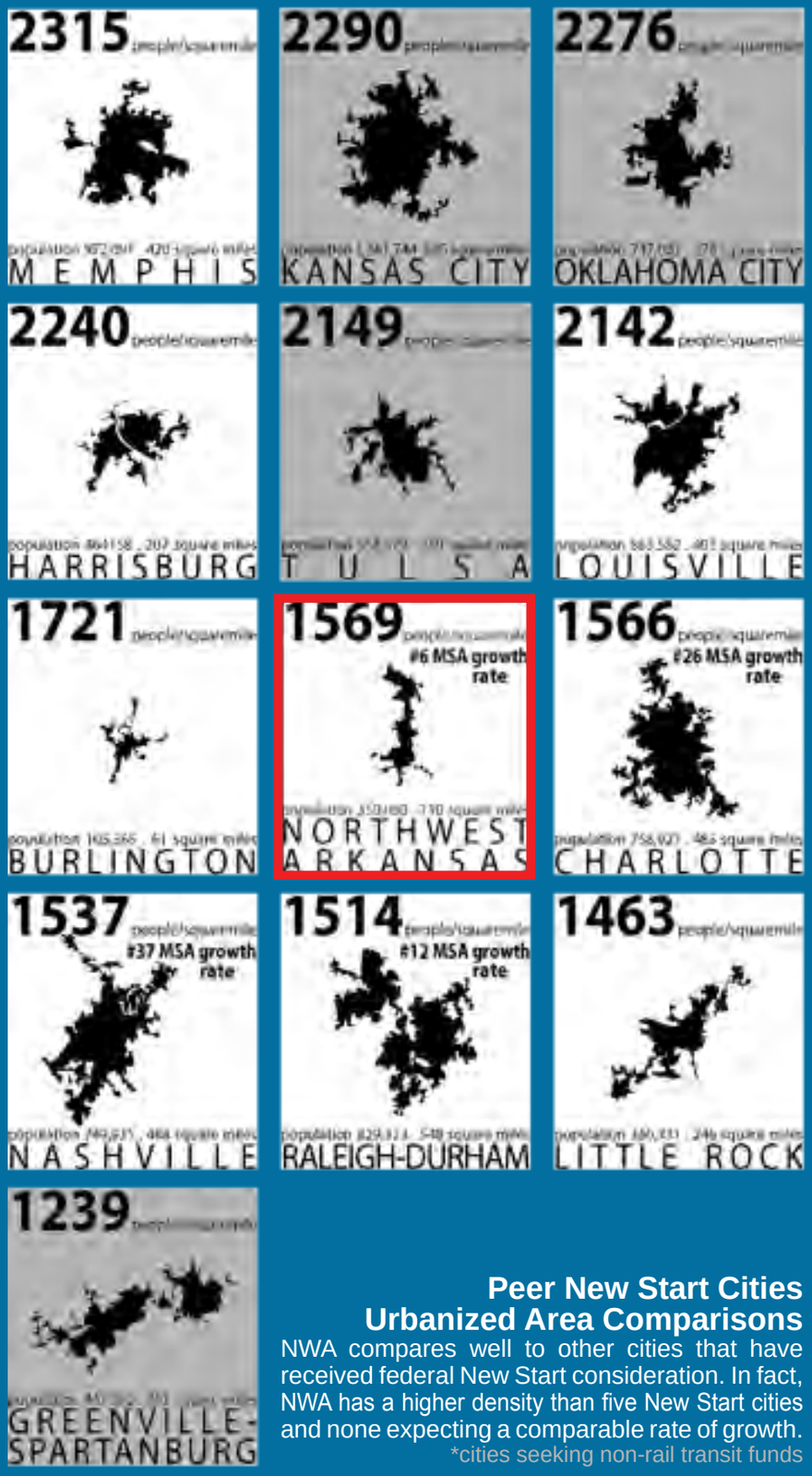


Rail transit offers an additional transportation option that can shift passenger traffic from highways and free up valuable highway capacity for the trucking and logistics industry of Arkansas.

the case for rail in NWA

Based on regional morphology (geometric structure and services distribution), NWA is an ideal candidate for rail transit development, arguably fulfilling the Federal Transit Administration's New Start criteria better than many recent recipients.

In addition to a favorable density comparison with recent New Start recipients, NWA's linear demand pattern is uniquely configured for rail transit. Most peer urbanized areas are radial or constellation structures, less than ideal configurations for fixed guideway efficiency. NWA's development along an existing rail corridor is ideal for mass transit. Linear organizations, however, are characteristically arterial with a low street connectivity ratio that promotes highway traffic congestion. Expanding highway capacity typically compounds congestion in arterial systems. An intermodal system including rail would absorb traffic demand with greater efficiencies. Rail transit would also increase accessibility for low-income and zero-car households, a ridership group located along the rail right-of-way. Almost all major regional employment and activity centers are located along the rail corridor, a key factor for achieving high ridership.



Peer New Start Cities
Urbanized Area Comparisons

NWA compares well to other cities that have received federal New Start consideration. In fact, NWA has a higher density than five New Start cities and none expecting a comparable rate of growth.

*cities seeking non-rail transit funds

The Federal Transit Administration New Start program is the primary financial resource supporting locally planned and operated transit investments. The New Start program has helped to make possible hundreds of new or extended fixed guideway projects across the country.

NWA as a New Start funding candidate

The calculus for rail feasibility has changed, no longer tied to a few large metropolitan regions and their high population densities. Communities nationwide are reinvesting in rail systems dismantled from their fabrics just 50 years ago.

NWA has significant populations that are more likely to use rail transit. These groups include: inter-city commuters, out-of-town business travelers, university students, retirees, Hispanics, and households without cars. Hispanics, another "early adopter" group to historically support rail ridership, comprise 20% of the populations of Springdale and Rogers and continues to grow in numbers. NWA is a popular retirement destination for the nation's elderly and home to over 21,000 students on college campuses in Fayetteville and Bentonville. These early adopters groups are progressive, inventive, and see the tipping point earlier than others. Rail also attracts a high number of discretionary riders, late adopters who would otherwise not use buses.

San Diego, California


Denver, Colorado

what is Transit-Oriented Development (TOD)?

…It's building a place, not just a transportation system. The creation of an engaging public realm beyond mere engineering of a transportation project is critical to rail transit feasibility.

…It's a regional planning instrument for developing land uses that consume less land per capita, conserve sensitive natural areas, and revitalize urban areas.

…It's creating a pedestrian-oriented urban district within a half-mile radius around a rail transit station.

…It's about guiding growth, rather than creating it. Unlike highway development, good transit design can capture sustained economic value from the triangulation of transportation efficiencies, community redevelopment, and shifting consumer habits due to "agglomeration efficiencies".

Being well-connected to the rest of the region is capitalized into the value of the land.

*"**Scenario Planning** is a tool that allows us to think outside of the box, constructing a series of plausible futures. In contrast to the myopic end condition produced by traditional forecasting, developing TOD scenarios, in all their possible forms, will enable us to imagine multiple ways in which the landscape of Northwest Arkansas may unfold. Through the use of scenarios we can open up and illustrate plausible and nuanced ways in which the future of NWA may grow, allowing us to then strategically guide and plan intelligently..."*

Eric Kahn, Architect and Scenario Planner
The Rail Transit Design Studio Participant

planning approach

its not just about transportation, but also...

What if choices in transit mode beyond the car were provided in NWA? pp. 34-61

Mobility

Urbanism

What if rail transit revived the amenity-rich environments of historic NWA downtowns? pp. 62-89

Commerce

What if commerce were integrated into the development of NWA neighborhoods? pp. 90-109

Environment

What if NWA directed its growth to become a model region for sustainability, lowering energy footprints, and weaving nature into the city? pp. 110-133

1

What if choices in transit mode beyond the car were provided in NWA?

Mobility

Will provide convenient access and transportation choice for all households and reduce household travel budget.

Will benefit the logistics industry as automobile traffic demand is shifted to rail, expanding highway capacity for trucking and commerce.

Will relieve traffic congestion and reduce time wasted driving on crowded roads.

In terms of transit and mobility did you know...

More than bus, rail transit attracts former car commuters…in Denver, 48% of light rail riders had never previously used public transit; in St. Louis it was 70%.

Average four-lane highways move 8,800 passengers/hour and cost $40 million per mile to build while rail moves 40,000 passengers/hour with average costs of $35 million per mile.

At capacity, rail carries the same number of passengers as a 16-lane highway and costs 80% less.

The Washington D.C. Metro is the most efficient rail transit system as 80% of its operating costs are covered by ticket fares.

Gasoline taxes at the pump cover only 25% of highway operating costs.

As little as a 5% mode shift from automobile to rail on major corridors is sufficient to halt congestion growth and justify rail investments.

Congestion is a non-linear phenomenon. Adding 100 additional vehicles per hour on a road at 90% capacity can increase delays by 20% or more.

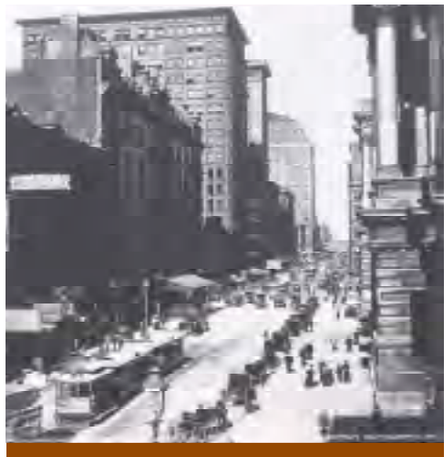
Rail transit requires about $12.5 billion in annual public subsidies, which average an additional $90 per Rail City resident compared with Bus Only cities.

1000 feet of street serves 6 buildings and you can only drive...

1000 feet of street serves 34 buildings and you can walk, drive, ride...

drive

ROAD



PLACE

jog
drive
ride the train
walk
bike
motorless carriage

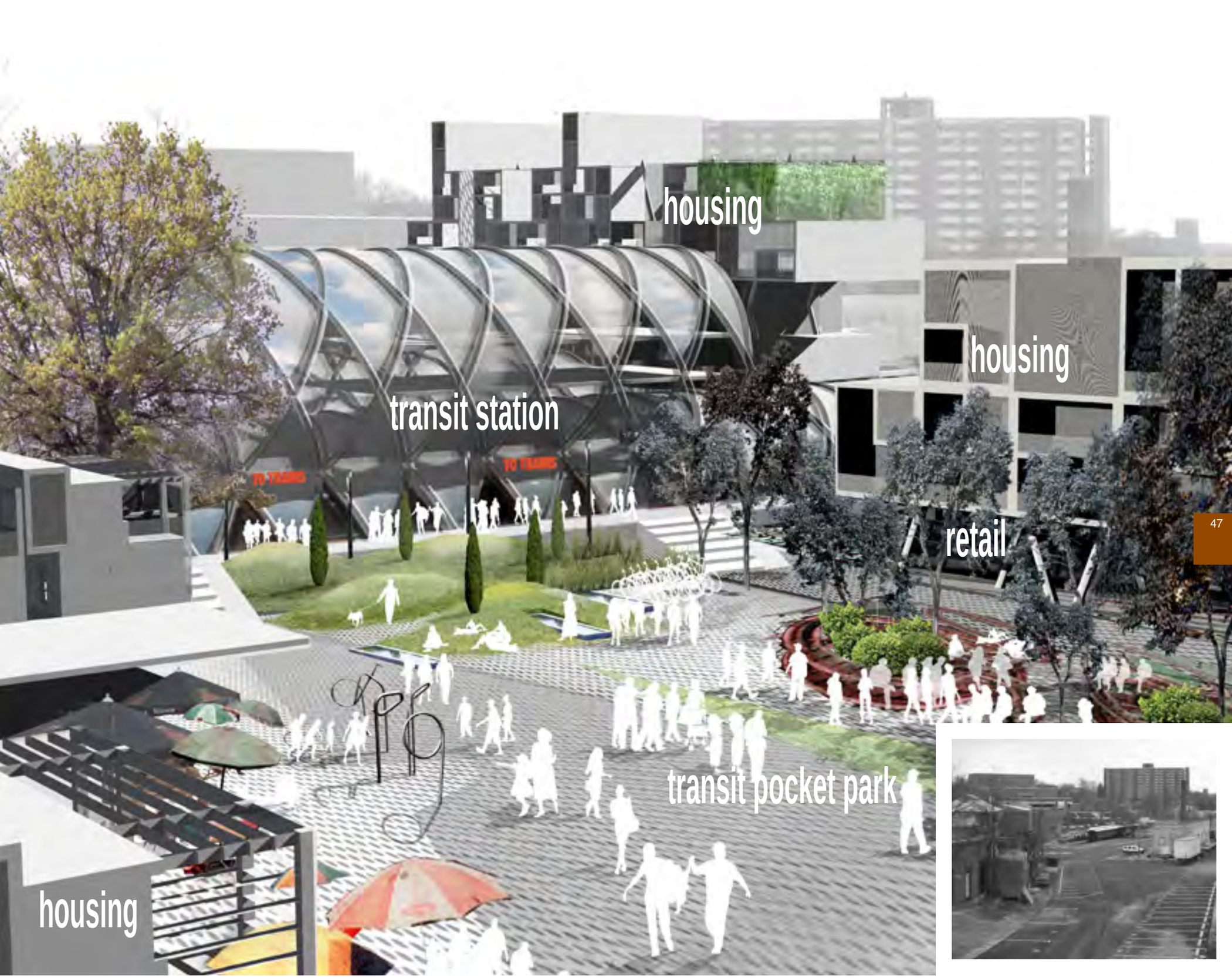
No transportation system—a highway, port, airport, or railroad—has ever been a profit-making system, as all must be socially subsidized. “Transit is expensive to build and operate, just as cars

and roads are… the real question is not the total cost, but what the money buys." (Dunphy, et al.)

Decades of transit underinvestment must be overcome by new projects—the initial project costs may

appear high, but are much smaller when averaged over the operational life of the facility. “Described differently, the major urban transportation problems facing cities are traffic and parking congestion,

traffic accidents, vehicle pollution and inadequate mobility for non-drivers, exactly the problems that rail transit can help solve." (Litman: 2005) Some argue that current traffic patterns and suburban



land development reflect market demands, when in fact both received more than half a century of government intervention and subsidy. The average U.S. household has 1.9 cars but only 1.8

The 2030 NWA Regional Transportation Plan stipulates $1.9 billion for highway funding, yet only $412 million will be available. Rail would absorb peak traffic demand and reduce the largest burden on the highway system. Rail would cost $.7-1 billion and be matched by federal funding allocated for rail. The combination of highway and rail would bring another level of economic development and smart growth not possible with highways alone.

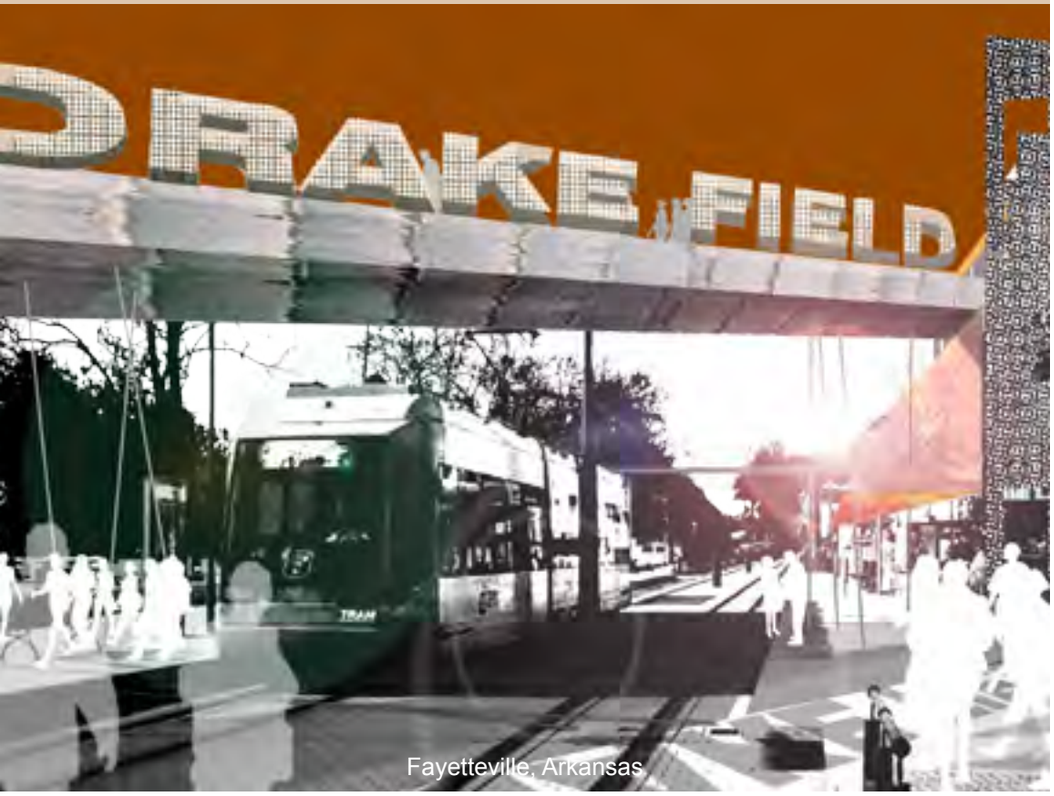
drivers. American drivers sat in traffic for a combined 3.7 billion hours in 2003, a 500% increase in just over 20 years. “A regular rush-hour driver wastes an average of 99 gallons of gasoline a year

Vehicle-miles in millions	54	7,077	1,628,332
Passenger-miles in millions	1,437	150,042	2,556,481
Expenses to Passenger per Mile	**14¢**	**20¢**	**51¢**
Percentage of Return from user fees	**30%**	**8%**	**18%**

U.S. Department of Transportation,
Bureau of Transportation Statistics (2001)

If our planning decisions were "fair-costed" for hidden costs, life-cycle costs, and negative externalities from pollution, affordability, fatalities, property damage, and lost time from the automobile, our transportation systems would certainly incorporate more public transit options.

cost of transportation



Fayetteville, Arkansas

Rail transit costs and return on investment are now competitive with highway costs.

Average new highway construction costs, including right-of-way acquisition, engineering, and utility reconfiguration, can easily exceed $40 million per mile for a new four-lane highway within a developed area—and over $100 million in urbanized areas. Springdale recently approved a bond issue of $105 million for road improvements over the next five years, which will not satisfy current needs.

The Raleigh-Durham rail system, a recent New Start recipient, is slated to cost $23 million per mile. NWA's system may be less expensive due to fewer conflicts with surface streets, cheaper land costs, and fewer active freight lines than in Raleigh-Durham. Arkansas & Missouri Railroad is a willing partner, which minimizes property acquisition costs—typically the largest capital expense for New Start cities.

In effect, transit riders whose ticket fares pay for 30-70% of their systems' operating costs, are subsidizing suburban motorists, whose gasoline taxes pay for only 25% of highway operating costs.

due to traffic. The average cost of the time lost in rush hour traffic is $1,160 per person." (www.publictransportation.org) British scientists have reported that the tension experienced by commuters

currently
300,000 cars

by 2050
1,250,000 cars

41 square miles of new parking
(the size of Springdale, Johnson, and Lowell combined)

how do you want to spend your time?

NWA traffic growth

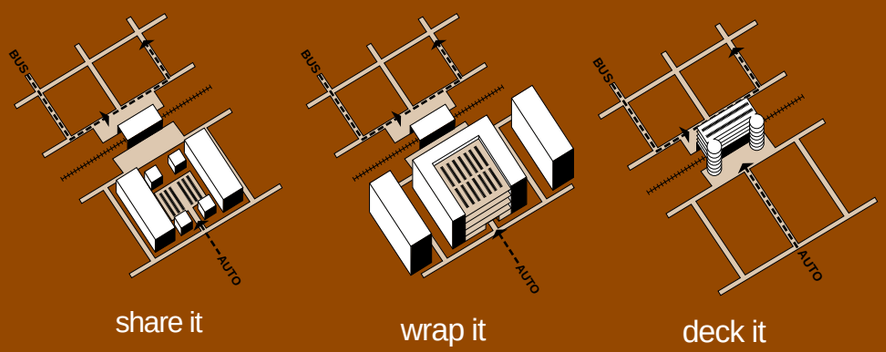
stuck in traffic is equivalent to that felt when parachuting for the first time. Medical symptoms ranging from sleep deprivation to digestive problems are linked to long commutes. “A 2004 article in the

new development captures a premium market value due to being well-connected to the rest of NWA

well-designed pedestrian facilities and civic spaces are important anchors in creating desirable public environments around transit stations

New England Journal of Medicine found that being stuck in a traffic jam more than doubles one's chance of experiencing a heart attack...", states Will Sullivan in "Road Warriors" U.S. News & World

Plano, Texas—Dallas Area Rapid Transit



share it wrap it deck it

Contemporary land development is planned for the 400 hours of driving by the average motorist annually, and does not satisfactorily design for the remaining 8,360 hours that the car is parked.

TOD parking strategies

One of the biggest challenges in planning pedestrian-friendly, walkable TOD districts is the accommodation of automobiles. A basic guide for TOD parking is to share it, wrap it, or deck it.

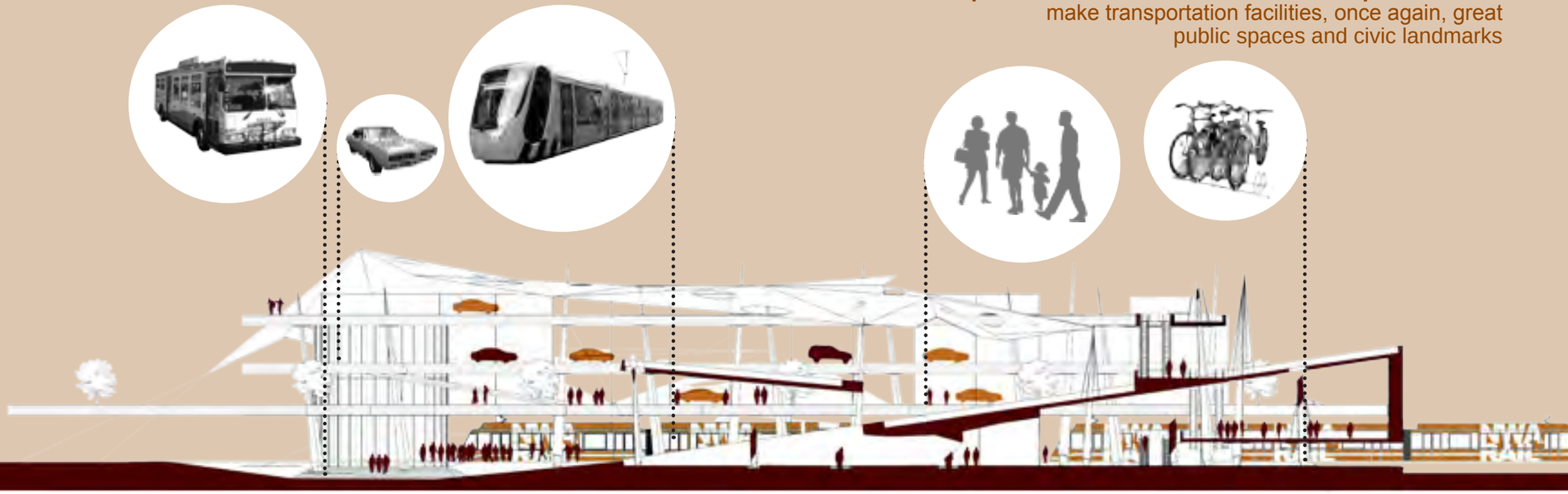
Use on-street parking to support ground floor commercial activity. Minimize large surface parking lots greater than two acres for private development.

A generally accepted planning practice locates commuter park-and-ride facilities at a 5-7 minute walk (one-quarter mile) from the rail station bridged by mixed-use development to accommodate commercial activity. Parking should not separate stations from their contexts nor impair pedestrian access between them.

Report, May 7, 2007. Highway capacity will increase by 10% between now and 2050, while the demand for ground transportation overall will increase by 250%. In 1970, before the installation

plan for intermodal transportation

make transportation facilities, once again, great public spaces and civic landmarks



of a modern rail transit system, 4% of Washington DC commuters used mass transportation, i.e., the city bus system. In 2000, in contrast, 38% used mass transportation, predominantly the Metro

connect regional mobility with local commerce

to create great civic places

subway system. Between 1998 and 2001 U.S. transit travel grew faster than automobile travel. Every

advance in transportation over the last two hundred years has enriched the ecology of the street.

2 Urbanism

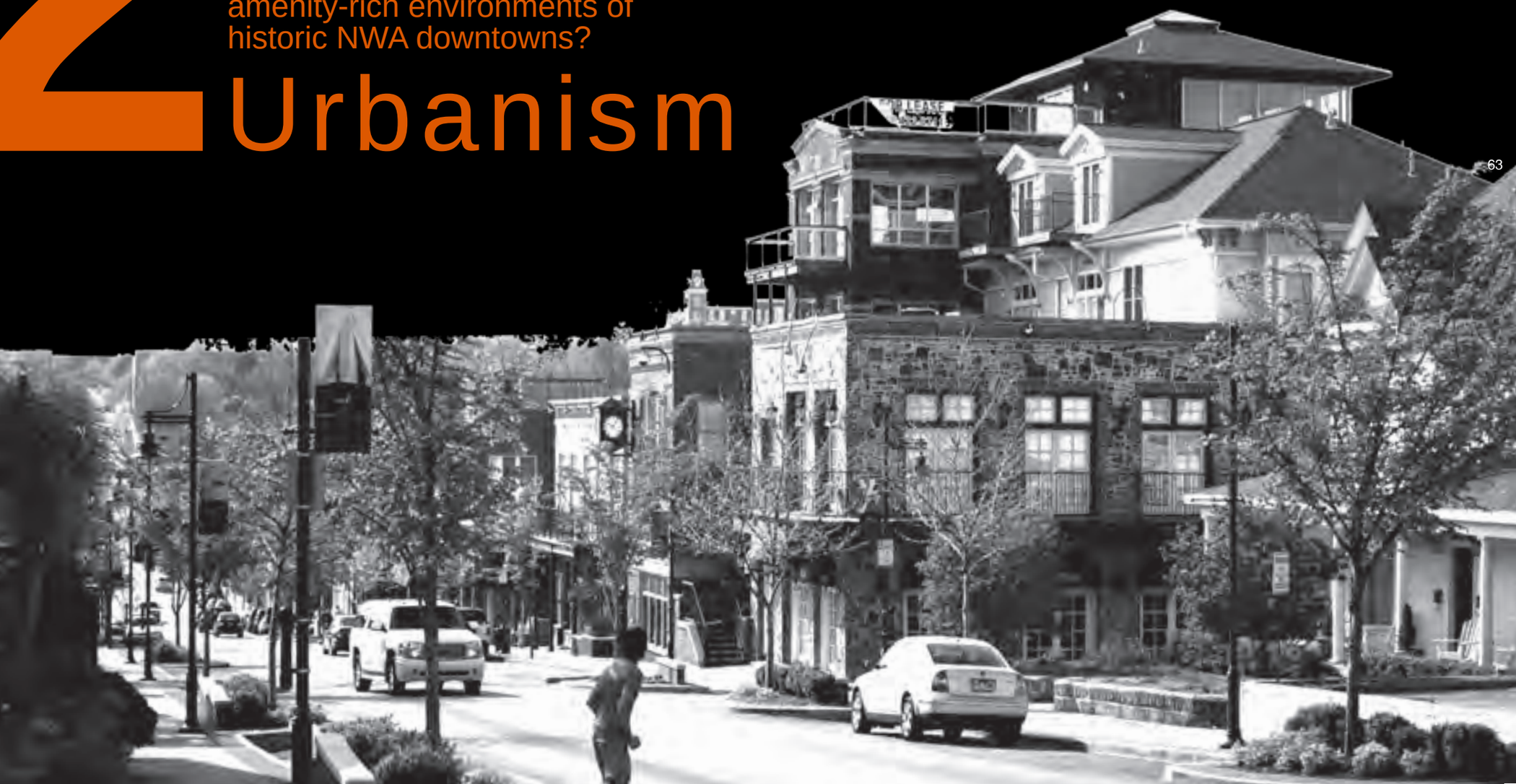
What if rail transit revived the amenity-rich environments of historic NWA downtowns?

Will allow walking to be a routine transit option, promoting physical activity and healthy lifestyles.

Will facilitate new venues for social engagement, culture, and entertainment.

Will provide new urban housing products—like walk-ups, lofts, and condos that feature auto-independent lifestyles.

Will reward preservation of historic structures and reuse of underutilized urban resources.



In terms of transit and urbanism did you know...

Rail transit feasibility requires a minimum density of 9 dwelling units/acre. Most low-density regions like NWA are built at 4 dwelling units/acre.

For each doubling of density within communities, annual vehicle miles traveled are reduced by 20-40 percent.

One study found that doubling a county-level density index is associated with a 6% increase in state-level productivity.

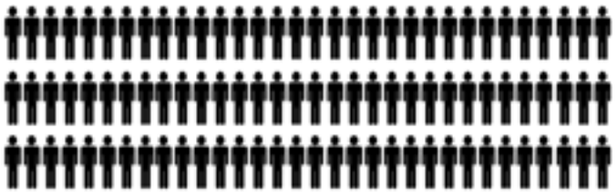
While demographers estimate that as much as 30% of the demand for housing is for denser, transit-oriented communities, less than 2% of housing starts are in this category.

Average home values increase $140 for every 10 feet closer they are to a transit station, beginning at 1,460 feet. A home located 100 feet from the station has a $19,029 premium over the same house located 1,460 feet away.

Residents of TOD’s typically reduce single-occupant vehicle commuting by 15-30 percent, about half of which shifts to transit.

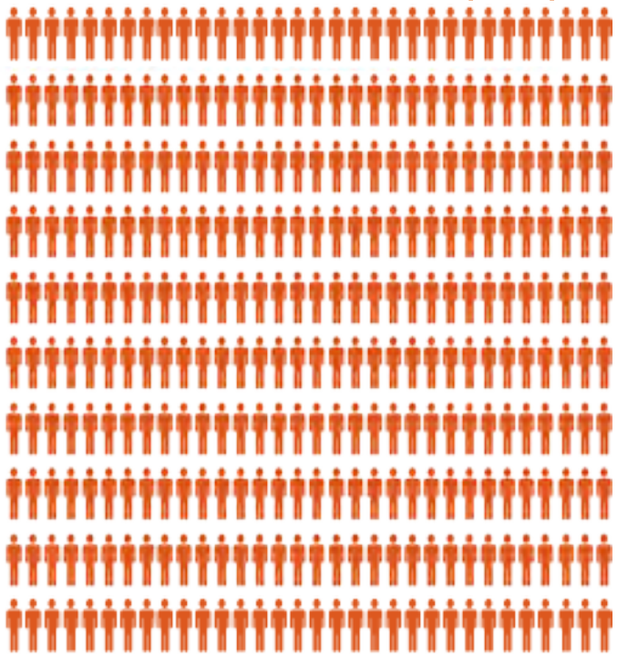
The value of commercial space near Metrorail stations in Northern Virginia has jumped more than 600 percent since the first station opened in 1977.

Three-quarters of Americans support the use of public funds for the expansion and improvement of public transportation.



currently
282,167 people

by 2050
1,000,000 people



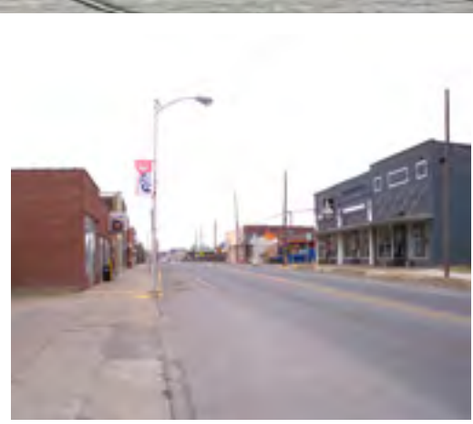
NWA population growth

Successive transportation technologies in canals, railroads, streetcars, horses, motor carriages, automobiles, and subways did not render the street obsolete, but rather enhanced its multimodal

...Springdale now

rail could unlock underutilized potential in NWA downtowns like Springdale...

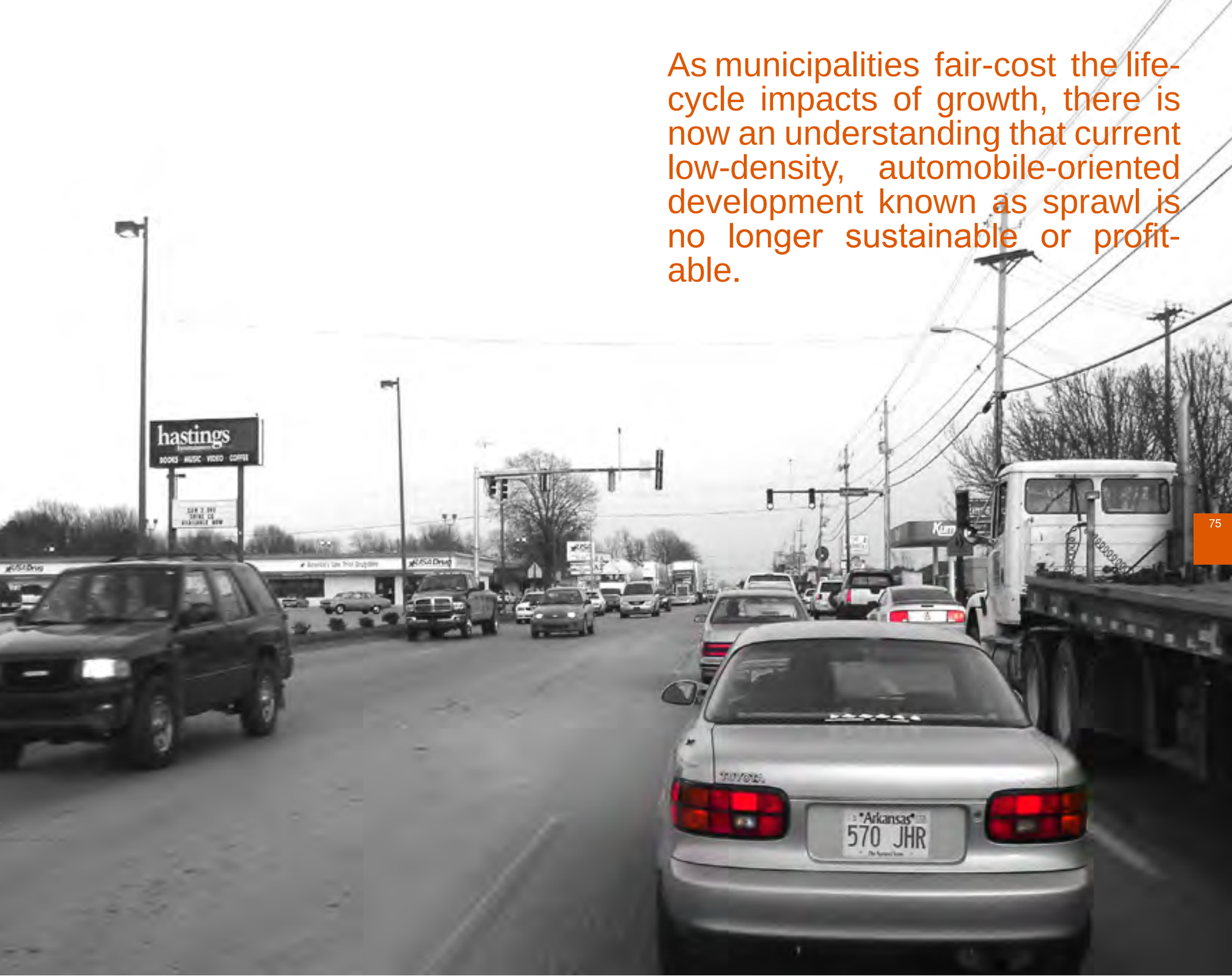
functioning. As Alex Marshall observes in his book, *How Cities Work*, each transportation technology acted as a “force multiplier” for the classic street, amplifying the commercial and social range of hu-



man interaction. The singular commitment to the automobile has eroded community access to multiple movement modalities, primarily walking. For every 10 minutes spent driving to work, community

involvement by the commuter falls 10%. “People who live and work in transit-oriented developments tend to own fewer vehicles, drive fewer annual miles, rely more on walking and transit for transporta-

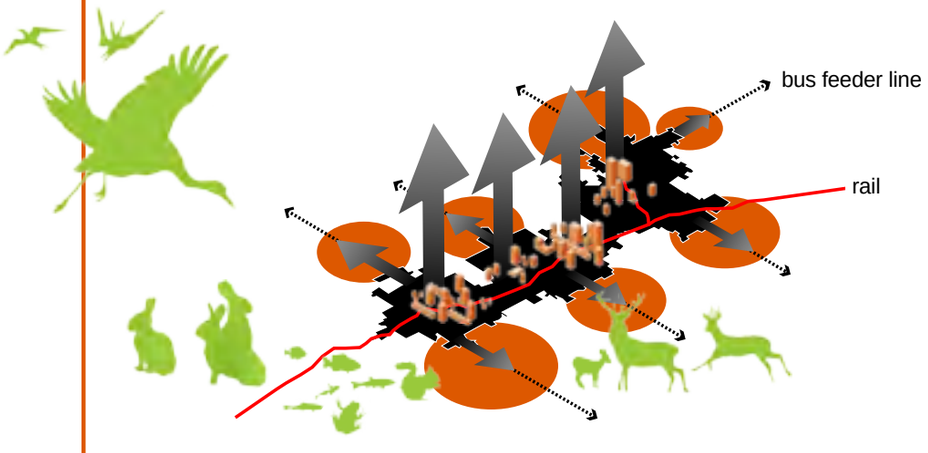
As municipalities fair-cost the life-cycle impacts of growth, there is now an understanding that current low-density, automobile-oriented development known as sprawl is no longer sustainable or profit-able.



tion, and as a result cause and experience less traffic congestion, fewer traffic accidents, reduced energy consumption and pollution emissions, improved fitness, and household travel cost savings."

2007 Northwest Arkansas

2050 Sprawl Scenario: erasure of the “Natural State”



2050 Transit Scenario: stewardship of the “Natural State”

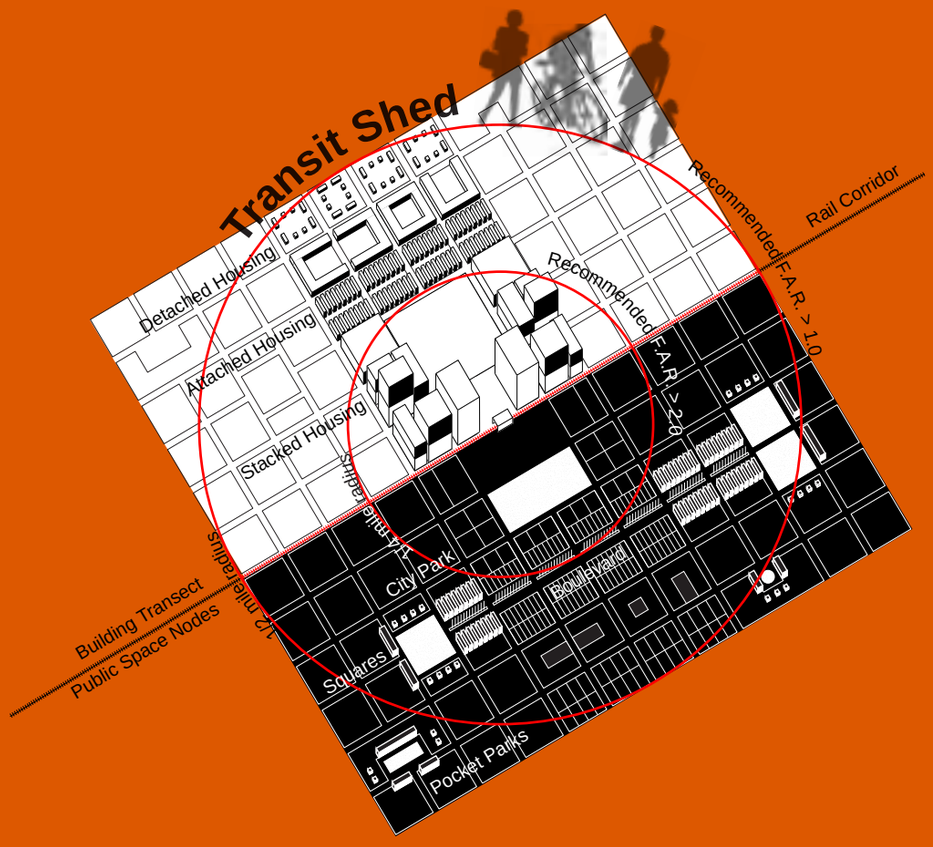
80% of the built environment projected to exist by 2050 has not yet been constructed...now is our opportunity to shape the region

Automobile Dependent
TRAFFIC CONGESTION
More Land Consumed
Higher Infrastructure Costs
More Pollution

or

Pedestrian Friendly
Increased Housing Choices
Reduced Traffic
Reduced Transportation Costs
Increased Choice of Transportation Mode

(Litman: 2005) Forty-seven percent of residents who live within one half mile of the Washington Metro in Arlington County, Virginia use rail transit to commute. Seventy-three percent of those commut-



planning within the transit shed should support “accessible” development patterns

accessibility enhances walkability among land uses through mixed-use development, higher densities, and pedestrian-scaled street networks

ers walk to stations. According to the Urban Land Institute, two-thirds of all New Start regions have

Streets/Public Space

TOD requires pedestrian-friendly street networks with both high connectivity and proximity among destinations. Well-designed pedestrian facilities and civic spaces are important anchors in creating desirable public environments around transit stations.

Blocks

Block sizes lose their capacity to support pedestrian activity above 500 feet, or seven acres, and ideally should be less than three acres or approximately 400’ x 300’.

Transit Station

Commercial uses, housing, employment centers and civic spaces should be within walking distance (half-mile) of transit stops. Transit stations may become activity centers within TOD districts rather than single-use constructions relegated to district margins.

Housing

All market grades of housing with a mix of type, density, and cost should be developed in TOD districts to create social and economic viability.

TOD planning metrics

Parking

Since parking is often the largest land use, urban parking strategies attentive to footprint, street frontage, and location must balance parking needs with the creation of a desirable pedestrian-oriented environment. Outdated suburban zoning codes result in parking areas greater than the building areas they serve. For example, at 5 spaces per 1,000 square feet of building, retail parking becomes 150% of the size of the enclosed building.

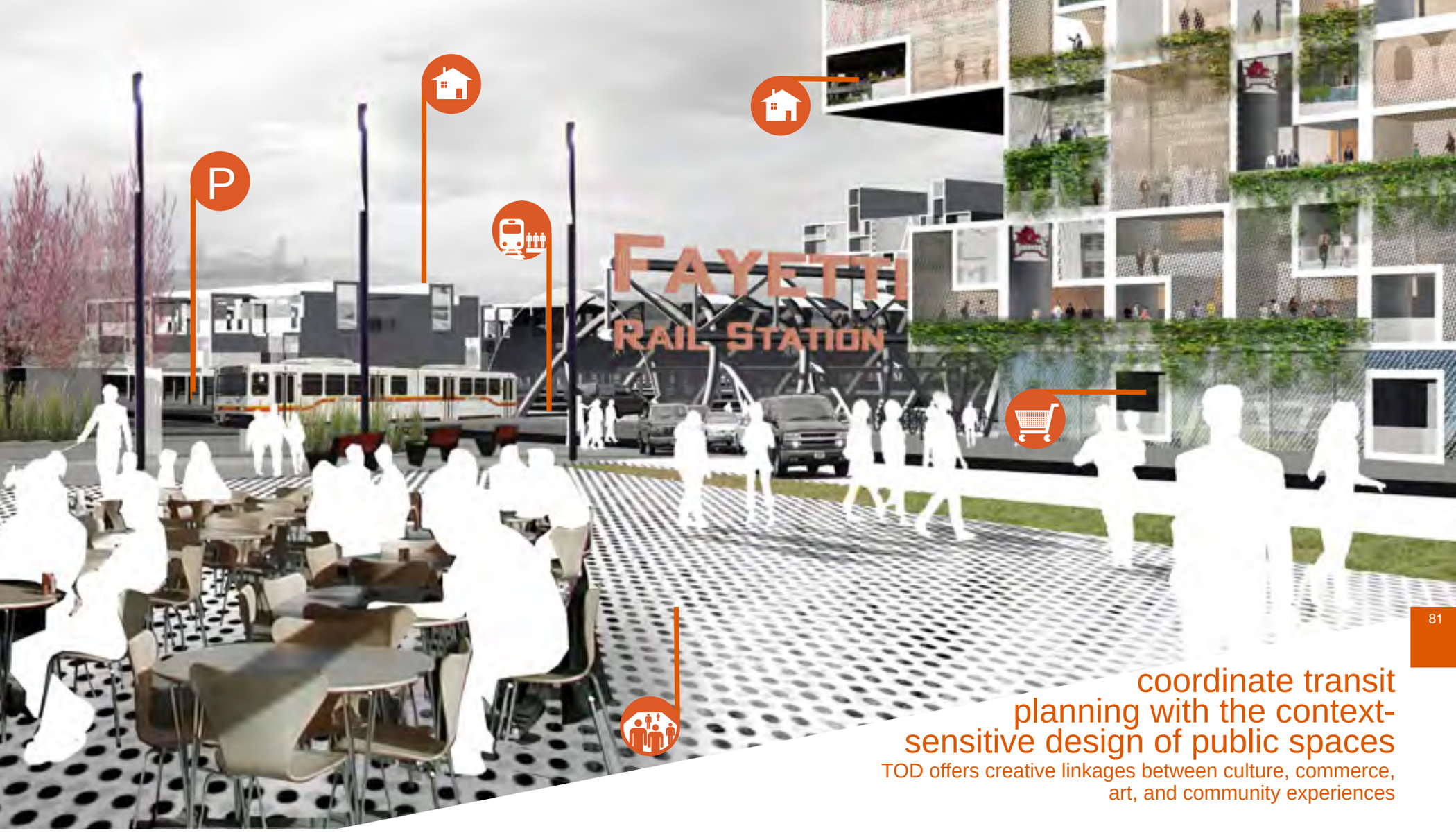
Employment Centers

Residential and employment land uses are significant determinants in creating ridership. Substantial ridership increases occur once employment centers concentrate 125 employees per acre in TOD neighborhoods.

Commercial/Retail

According to the Urban Land Institute, the primary role of retail and service functions in TOD districts is their “amenity contribution” in the creation of great places for living and working. Outside of large retail agglomerations like malls and big box power centers, retail on its own will not generate notable ridership…”retail follows rooftops”.

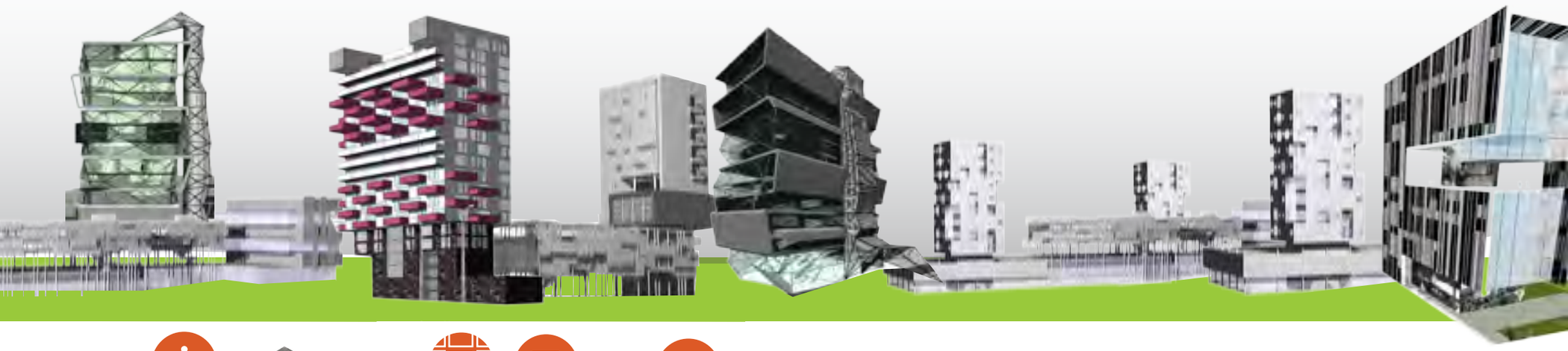
housing densities of four housing units/acre, well under the 15 units/acre recommended for rail transit

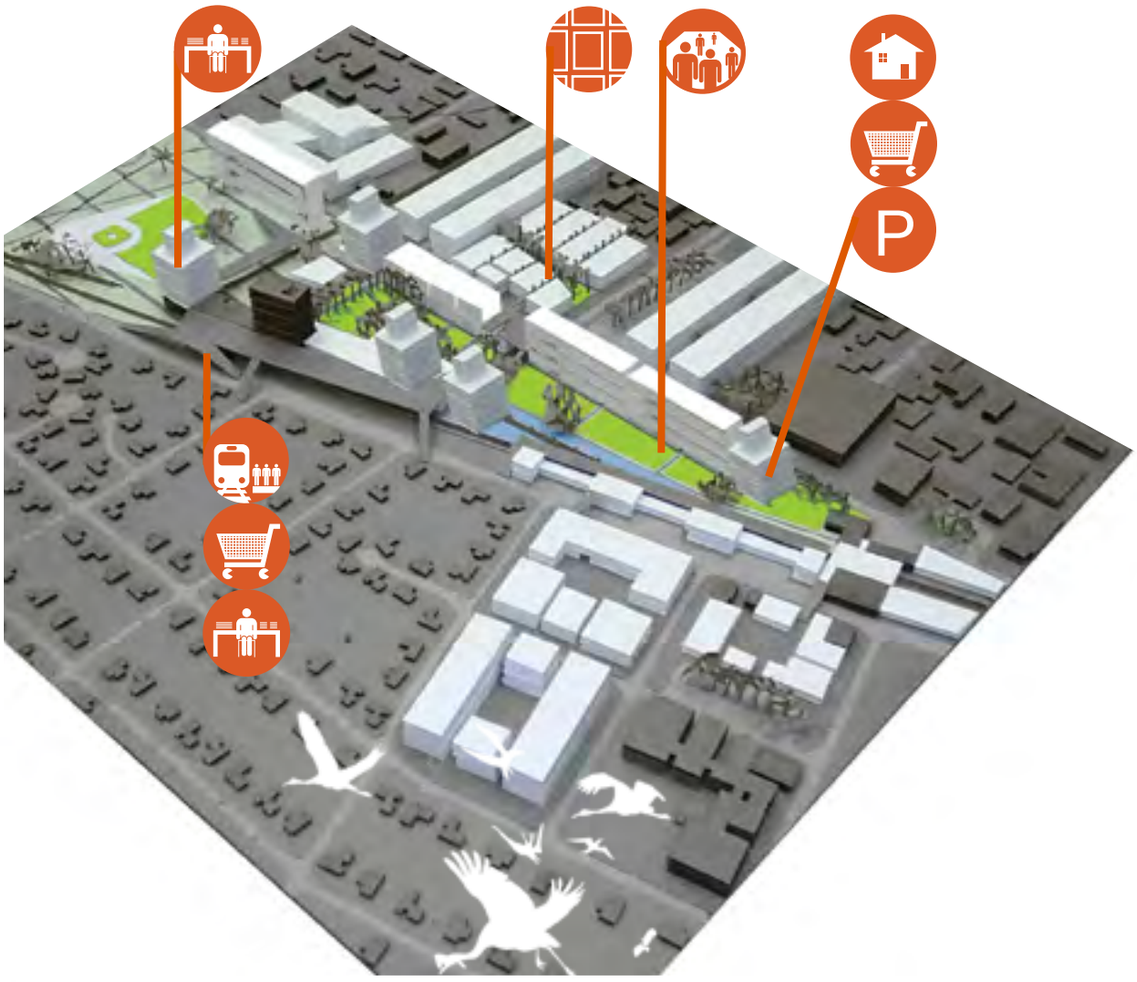


coordinate transit planning with the context-sensitive design of public spaces

TOD offers creative linkages between culture, commerce, art, and community experiences

feasibility. This indicates that regions are subsidizing rail transit as a mechanism to achieve denser, less sprawling (and thus less costly) land development patterns like those called for by smart growth





incorporate urban floodplains and other areas with low-development potential as transit-accessible parks

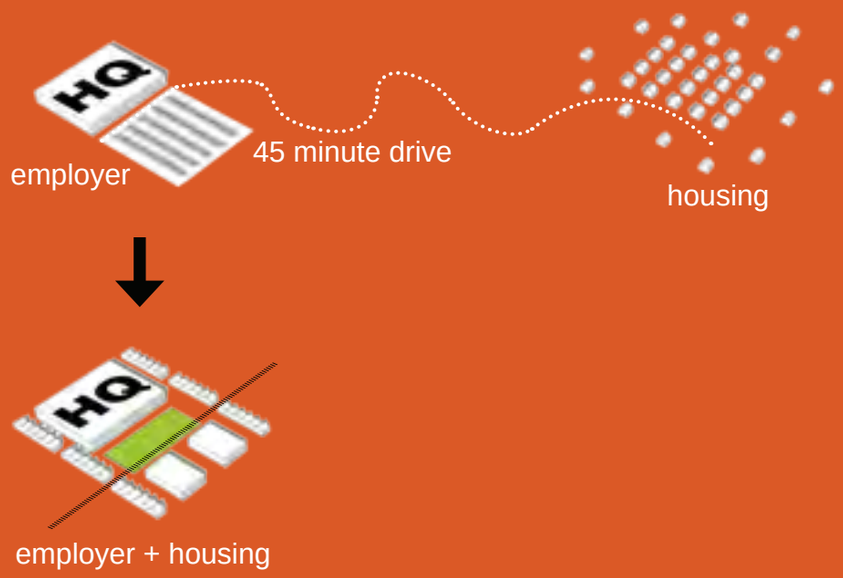
parks increase adjacent property values

planning advocates. In his *The Flight of the Creative Class*, author Richard Florida writes: “A common feature of leading creative centers around the world is efficient and heavily trafficked subway and

intensify urban housing

housing diversity is the catalyst for subsequent commercial development as “retail follows rooftops”

light rail systems. The availability of subway and rail transportation was a key factor cited by creative people in the interviews and focus groups for *The Rise of the Creative Class*, trumping amenities



integrate corporate campuses with the city

TOD districts create a high quality commuter lifestyle

like bike trails, coffee bars, and music venues. In our largest and most creative centers, such public transportation does exist and provides an edge in attracting talent. But it is sorely inadequate in far

Portland, Oregon

Portland, Oregon

"…there is likely to be significant demand for housing within a half-mile radius of fixed guideway transit stations…over the next 25 years. Our market assessment shows that at least a quarter of all new households—14.6 million households—could be looking for housing in these transit zones… more than double the amount of housing in transit zones by 2025."

Reconnecting America, *Hidden in Plain Sight: Capturing the Demand for Housing Near Transit*

TOD as a new real-estate product

Coincident with renewed investment in America's downtowns, TOD as a new real estate product can improve housing affordability, revitalize downtowns, introduce mixed uses into single-use suburban neighborhoods, and augment public space in communities.

TOD success depends on the ability of the market to deliver high-quality real estate solutions responsive to consumer preference for urban environments. One recent study found that one-third of all residents living in conventional development would have preferred a more walkable environment, suggesting a mismatch between housing supply and demand.

Four criteria are important in planning TOD:

- Location efficiency
- Increased mobility, shopping, and housing choices
- Higher value capture and return on investment
- Balance between requirements of successful place-making and transportation planning

Success also depends on local government's ability to implement infrastructural improvements supportive of TOD market investments.

too many others." "Rail transit also tends to increase regional employment, business activity and productivity by reducing fuel and vehicle import costs, and shifting consumer expenditures to more

3

What if commerce were integrated into the development of NWA neighborhoods?

Commerce

Will support small businesses and regional supply chains, enhancing the availability of locally produced quality products and services.

Will produce a vital and interesting street life, reestablishing community and personal relations in local commerce.

Will improve convenience of everyday shopping through farmer's markets, urban arcades, neighborhood grocers, green grocers, and street vendors.

In terms of transit and commerce did you know...

A 2002 study showed that participants were willing to pay 12% more to shop on tree-lined streets like those in TOD neighborhoods. They perceived shops on tree-lined streets as better maintained, more pleasant, and having higher quality products.

Every dollar that U.S. taxpayers invest in rail transit generates $6 or more in economic returns. No other transportation system has comparable economic development power.

A typical set of transit investments creates 19% more jobs than the same amount spent on a typical set of road and bridge projects.

On average, a typical state/local government could realize a 4-16 percent gain in revenues due to increases in both income and employment generated by transit investments.

Residents of cities with well-established rail transit systems spend an average of 16% of their total household expenditures on transportation, compared with cities that lack rail systems, whose residents spend 18%.

Percentage of total household expenditures on transportation in Arkansas: 20.5%.

Americans living in transit-intensive areas save $22 billion each year by using public transportation.

...Bentonville now

rail transit could incubate under-utilized local commercial environments...

import costs, and shifting consumer expenditures to more locally-produced goods." (Litman: 2006)

Mixed-use communities have a more robust economy and are less costly to service than 'bedroom

communities' comprised only of residential land uses. This was confirmed in the "Cost of Community Services Study" conducted by the American Farmland Trust, showing that farmland and open space

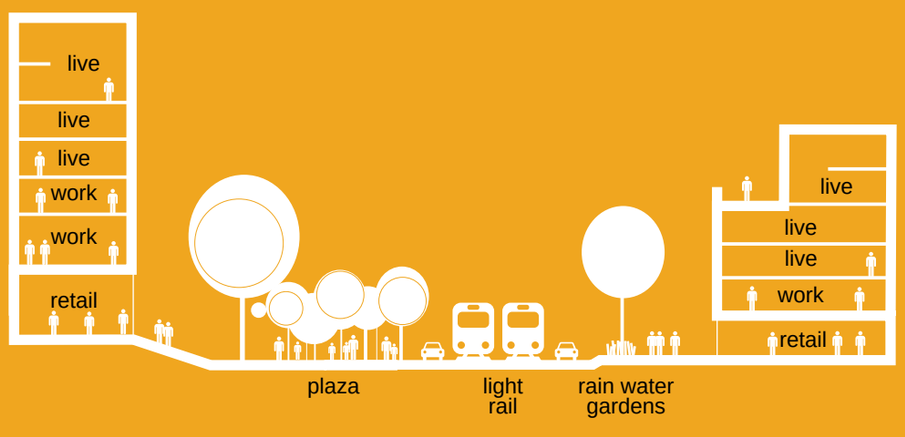
required $.53 in services for every dollar paid in taxes whereas residential land required $1.14 for every dollar paid in taxes. The annual cost of providing public services was 43% higher for sprawling

Separated from other uses and accessible only by vehicle, commerce adopted a monolithic development pattern, lacking the social complexity intrinsic to desirable places.

development compared with compact development. Most environmental problems are reflections of social problems. “The winners in the new economy will be those regions that learn to work together

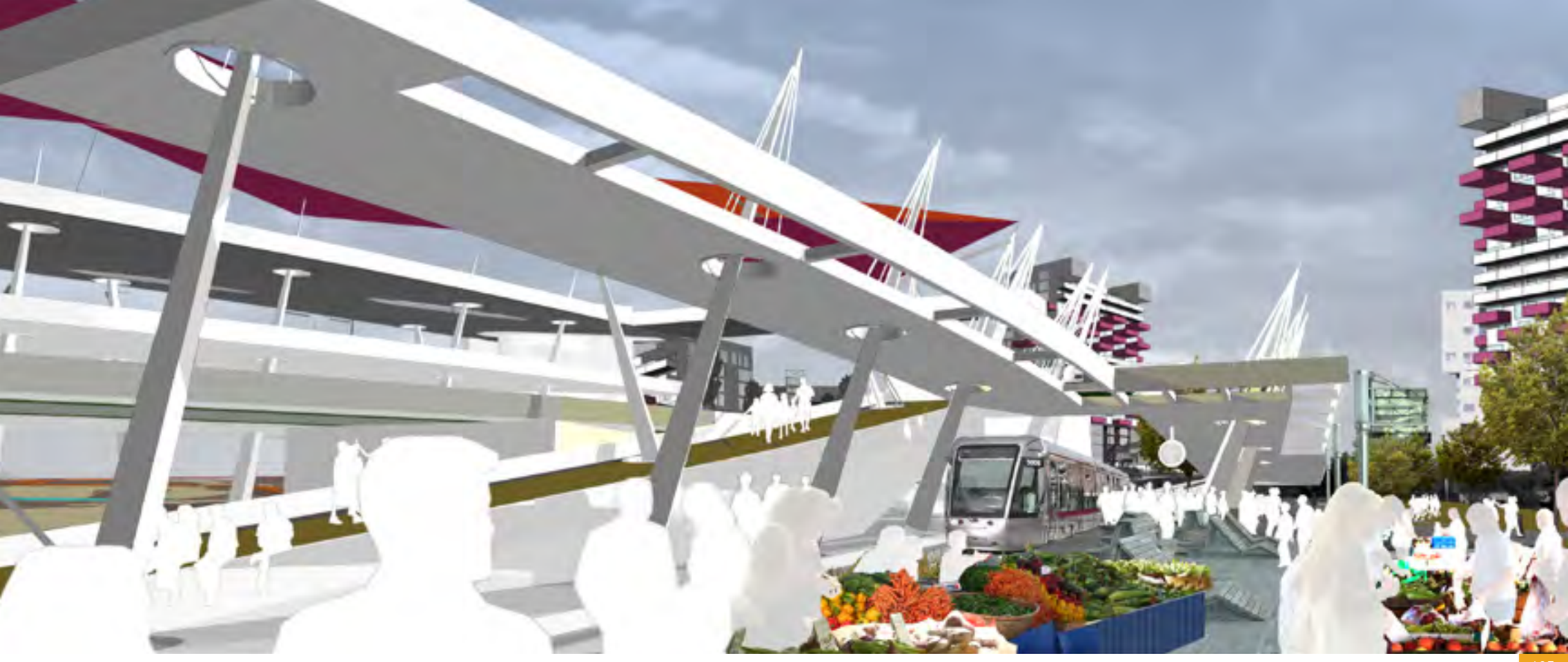
introduce landscape systems into transit corridors

green streets facilitate greater social and economic exchange



transit corridor streetscape

to relieve traffic congestion, build affordable housing, preserve open space, and promote economic development", states author and former mayor of Indianapolis, William Hudnut. Political leadership must



integrate the transit experience with other activities

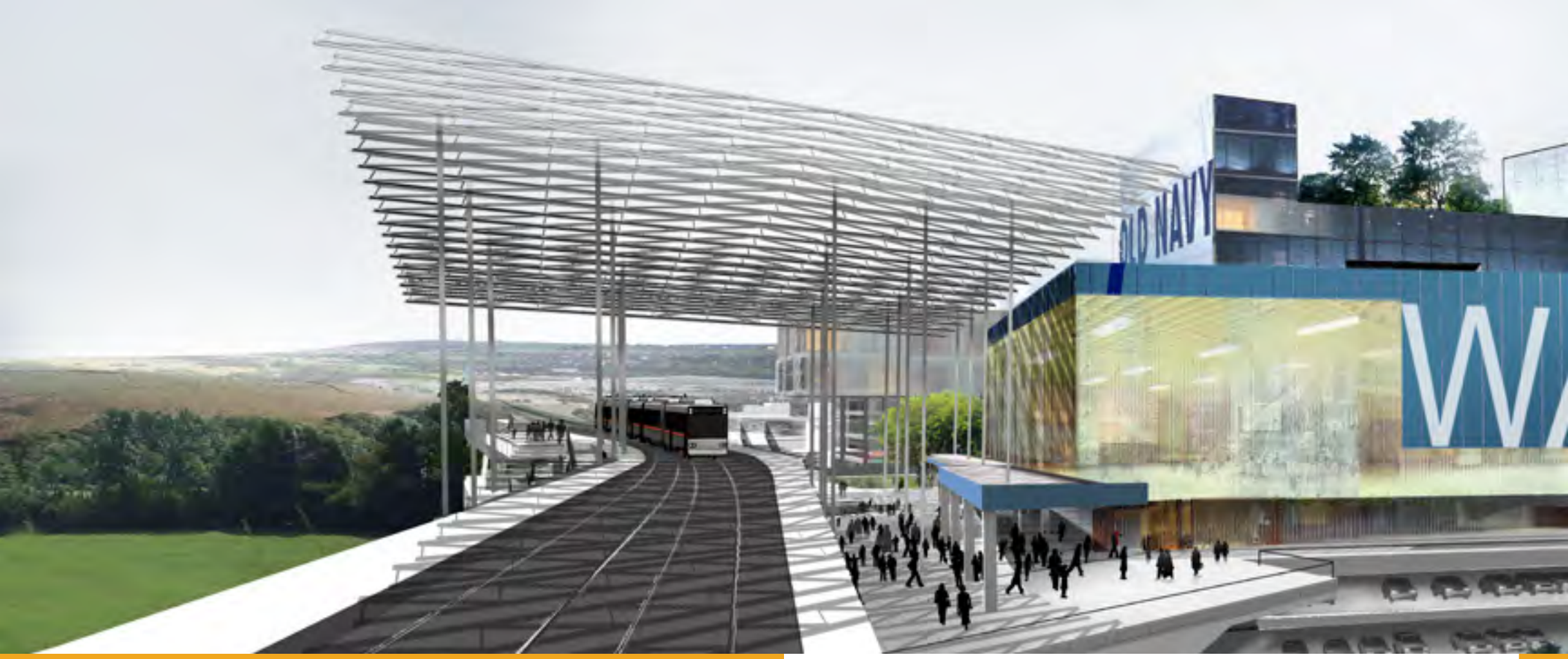
Lowell has the greatest potential to be an exemplary transit town as it emerges from being a collection of subdivisions

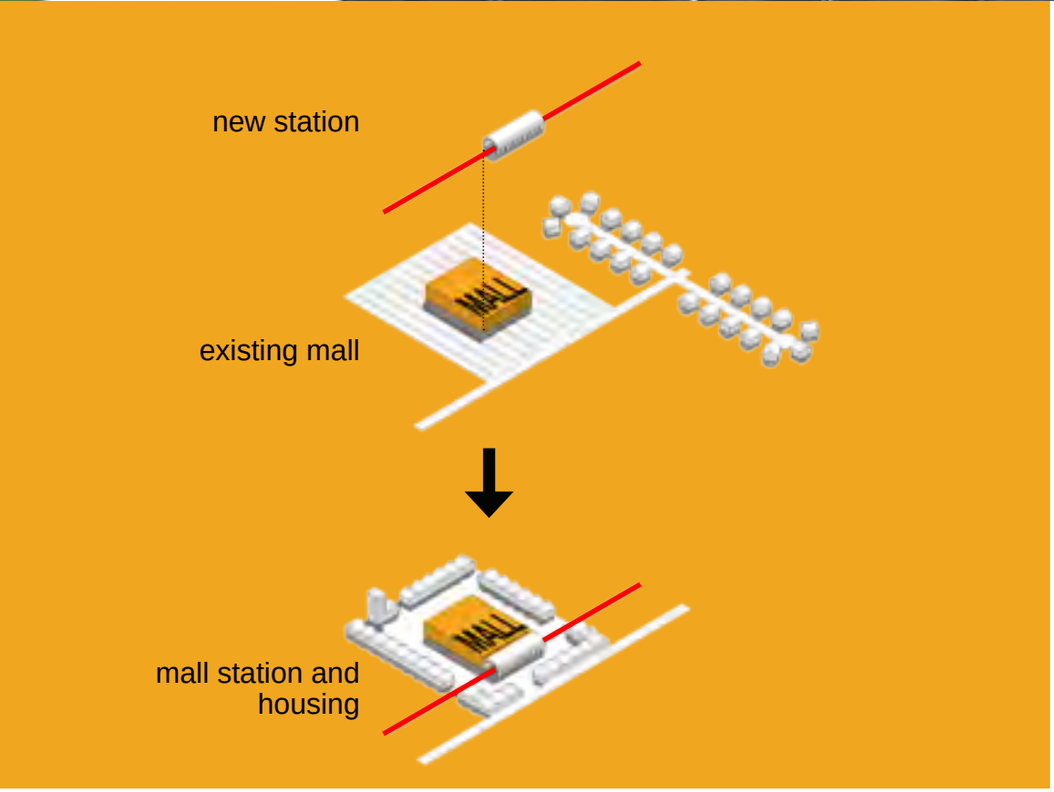
substitute the *silos* of specialized thinking with integrated approaches to planning and development.

The environmental costs of sprawl are high: three to four times more miles of road are needed to serve

revitalize and strengthen regional commercial anchors

the single-use zoning of the NWA Mall area could be readily transformed into a mixed-use neighborhood

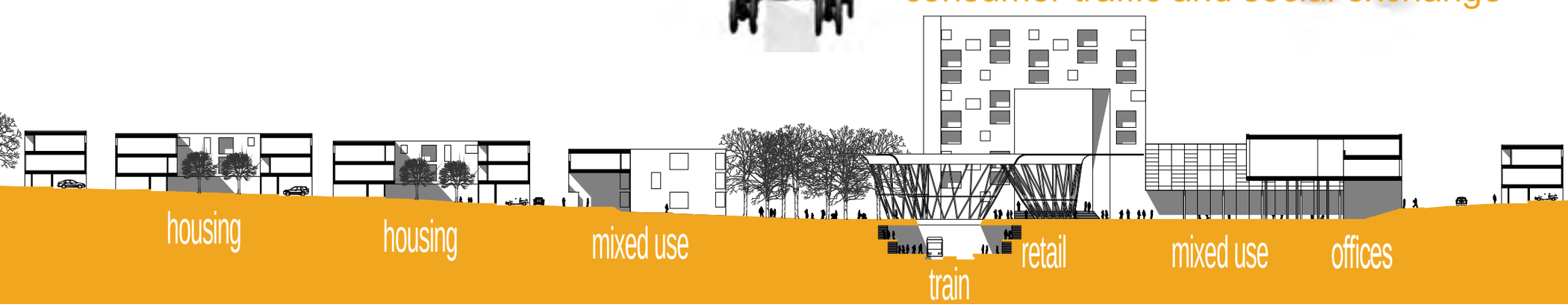




development in suburban communities versus urban centers, and ten times more in rural communities.

Every hour more than fifty acres of U.S. farmland are consumed by development. Studies indicate

TOD mixed-use creates greater consumer traffic and social exchange



that per capita traffic fatality rates decline with increased per capita transit ridership. “Compared to private vehicles, public transportation produces 95% less carbon monoxide (CO), more than 92%

4

What if NWA directed its growth to become a model region for sustainability, lowering energy footprints, and weaving nature into the city?

Environment

Will support less land consumption since rail transit prompts urban and dense development.

Will reduce energy consumption, as rail requires less energy per capita than the automobile.

Will reverse land development sprawl, allowing for conservation of valuable ecological systems.

In terms of transit and the environment did you know...

Light rail is an emissions-free transit mode.

Light rail consumes fuel at one-third the rate of a car and one-fourth that of an SUV per passenger mile.

Public transportation saves more than 855 million gallons of gasoline, or 45 million barrels of oil a year—a level equivalent to the energy used to heat, cool, and operate one-fourth of all American homes annually.

Regions are scrambling to follow San Francisco's commitment to supply 50% of its municipal power budget from renewable energy resources by 2015.

Converting land from second-growth forest to pavement represents an irreversible environmental cost of $25,000 per acre, and $40,000 per acre of wetland.

Highway fatalities in U.S. during 2001: 46,803

Light rail fatalities in U.S. during 2001: 22 (21 due to motorists illegally crossing over rail tracks)

Sprawl increases local road lane-miles 10%, annual public service costs about 10%, and housing costs about 8%, increasing total costs an average of $13,000 per dwelling unit.

Since transit causes otherwise sedentary people to walk or bicycle an hour or more a week it provides significant health benefits.

At four units per acre the 2050 NWA housing buildout alone will consume 33,677 acres of farm and natural lands.

2050: projected land consumption= 52 square miles

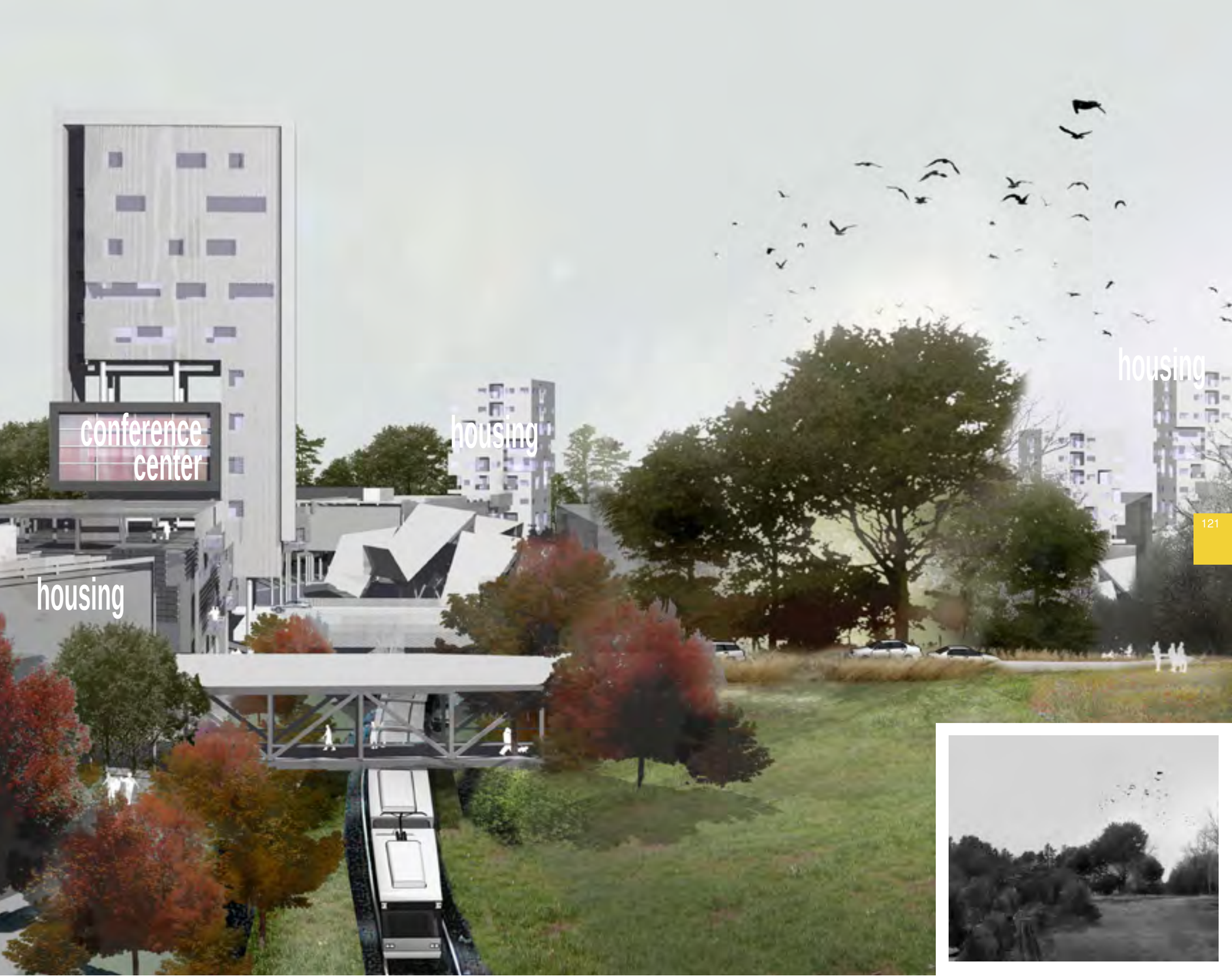
(the combined size of Fayetteville, Johnson, and Lowell)

fewer volatile organic compounds for every passenger mile traveled." (www.publictransportation.org)

Studies show that once 10% of a watershed's surface is paved, degradation takes place, and at 30%

paved, irreversible environmental degradation occurs within the watershed. Two-thirds of Los Angeles' surface area is paved. Houston provides the equivalent of 30 parking spaces per household,

far above the national average of eight spaces per household. Automobile infrastructure requires 12 times the surface area of rail transit infrastructure. One study showed that state economies with

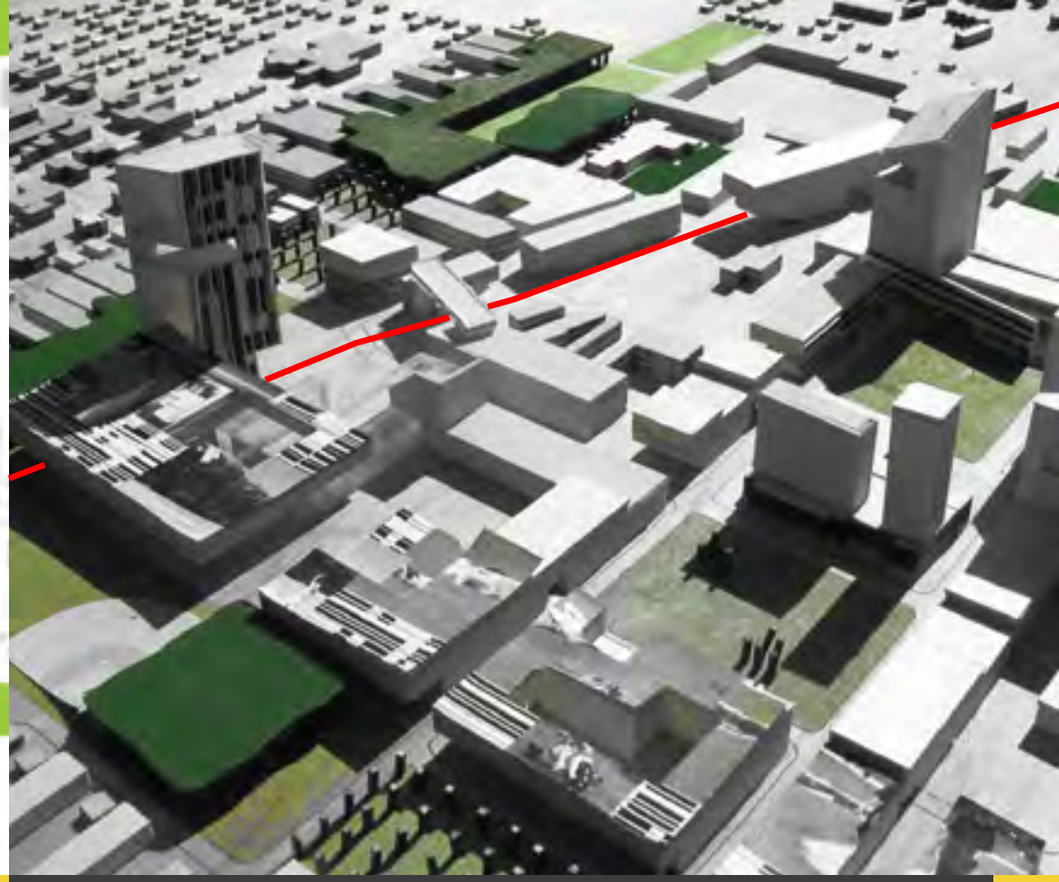


strong environmental standards have grown nearly one-half percent faster than states with weaker environmental standards. Electrified transportation, like light rail, is more environmentally benign as

cultivate floodplains in urban areas as development assets

higher density commercial development requires fewer roads, which lessens the impact on urban streams and waterways

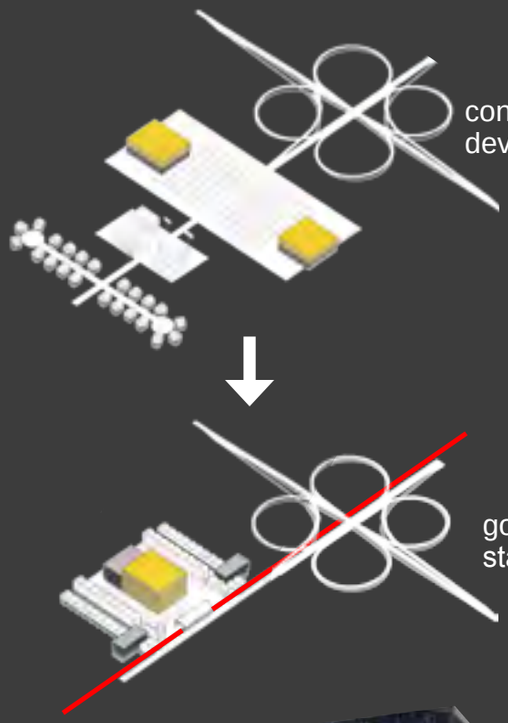
central power plants are more efficient thermodynamically and their emissions can be more easily controlled. Electric motors are dramatically more efficient than internal combustion engines. TOD is



TOD densities preserve forestry for urban “green rings” and parks

greenway systems also maximize pedestrian connectivity, complementing other transit modalities

also more energy-efficient in providing services and moving goods. Postal workers can walk their routes, many police can walk or bicycle a beat, and deliveries can be concentrated rather than



distinct urban-ecological edges amplify the benefits of both urban and ecological services

like beaches, being at the edge creates value

offices

housing

parking

housing

station plaza

floodplain park

spread out, states Robert L. Hirsch in “Peaking of World Oil Production: Impacts, Mitigation, & Risk Management”. In her book *Asphalt Nation*, Jane Holtz Kay recalls a speech by President Reagan

Arkansas: “The Natural State”

urban development + landscape creates unique gateways for NWA communities

before the Detroit Automobile Club where he “asked for an end to the huge federal subsidy of $35 per train passenger, ignoring the $42 subsidy per flyer and the auto-based subsidies at seven times

($245) mass transit's." Highway construction costs average about $10 million per lane mile. From a household's perspective, rail transit provides an attractive return on investment: quality rail transit

in one year of the Iraq War—a war essentially about oil—the U.S. spent enough money to construct nearly 200 regional light rail systems

requires about $95 annually per capita in additional taxes, but provides direct transportation cost savings that average about $450 annually, indicating an annual financial return of about 500%. (Litman: 2007)

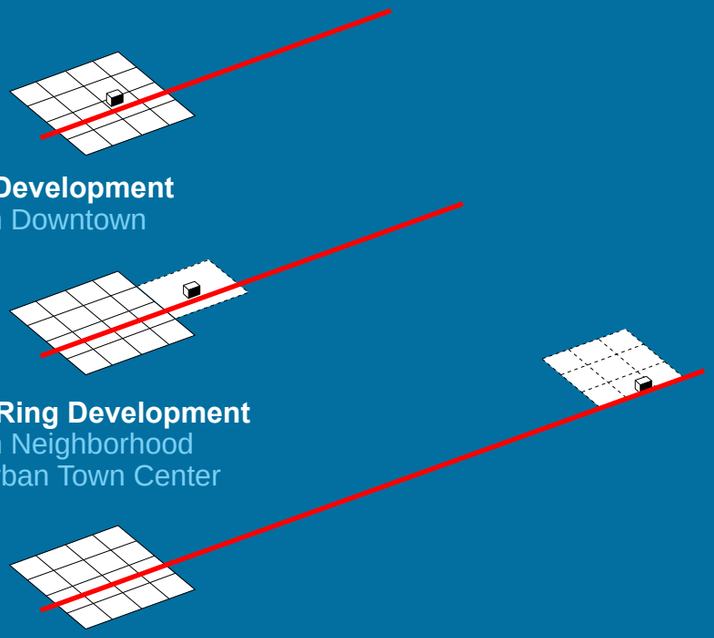
the future is now

More than 60 “new economy” regions nationwide have developed rail transit systems. Could rail transit help NWA to become the “Center of the New Smart South”?

These 60 regions compete for the same labor pool, business starts, and creative economic development as NWA. Will lack of planning foresight compromise our future economic sustainability when compared to peer regions?

More then simply a movement system, transportation is an ecology determining how cities function. Rail communities consistently experience expansive economic and environmental returns. Rail will multiply lifestyle choices for NWA.

The NWA rail system would intensify urban living scenarios while also serving residents who choose to live outside the city in the region’s distinguished Ozark Plateau landscape—now threatened by sprawling development. Rail operates as a multiplier development force for creating more innovative and sustainable forms of living.



Infill Development
Urban Downtown

First Ring Development
Urban Neighborhood
Suburban Town Center

Greenfield Development
Suburban Neighborhood
Commuter Town Center

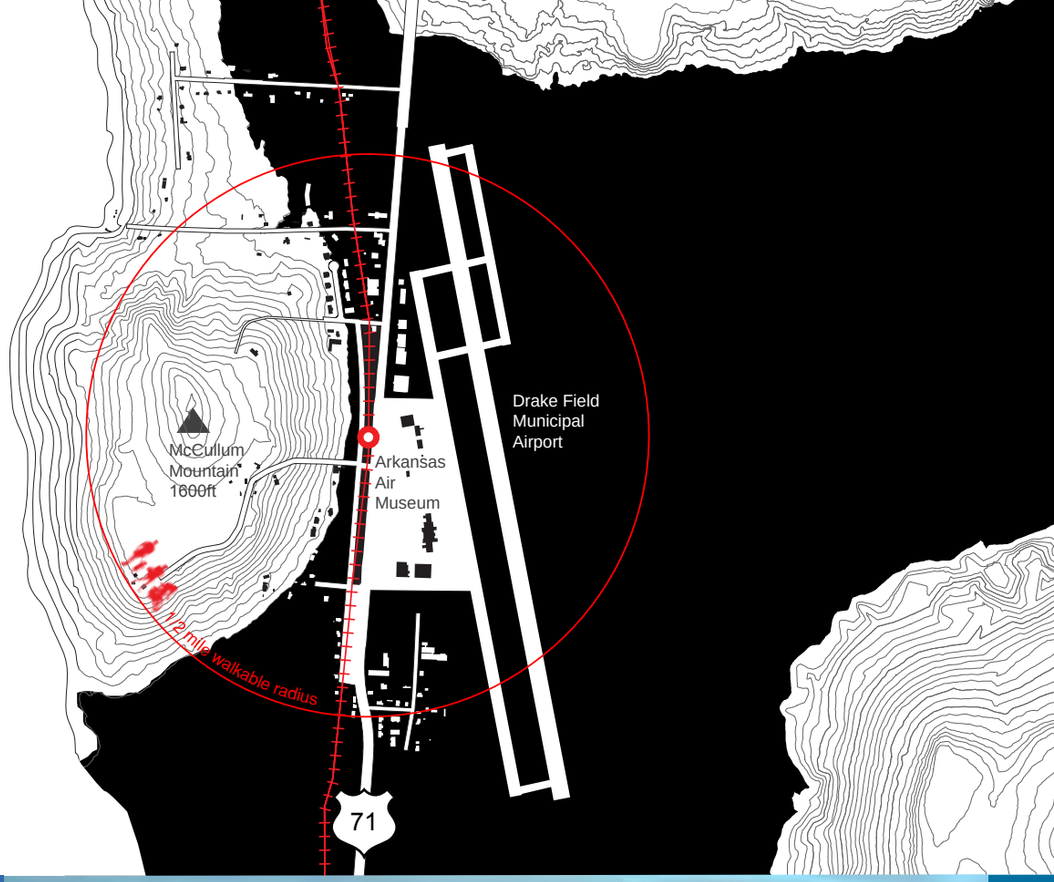
Different transit stops would emphasize different uses given their respective contexts. Several NWA locations already house concentrated employment centers. Historic downtowns would likely absorb the greatest mix of uses while greenfield sites would likely favor residential development followed by retail. Though a full range of uses would not necessarily occur at each stop, a linear mix of uses would likely become distributed throughout the line, balancing cycles and frequencies of use.

TOD station types

TOD Type	Land Use Mix	Minimum Housing Density	Frequencies
Urban Downtown	Office Center Urban Entertainment Multifamily Housing Retail	>60 units/acre	<10 minutes
Urban Neighborhood	Residential Retail Commercial	>20 units/acre	10 minutes peak 20 minutes off-peak
Suburban Town Center	Primary Office Center Urban Entertainment Multifamily Housing	>50 units/acre	10 minutes peak 15 minutes off-peak
Suburban Neighborhood	Residential Neighborhood Retail Local Office	>9 units/acre	20 minutes peak 30 minutes off-peak
Commuter Town Center	Retail Center Residential	>9 units/acre	Peak service Demand responsive

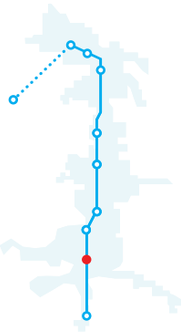
Modified from Reconnecting America, *Hidden in Plain Sight: Capturing the Demand for Transit*

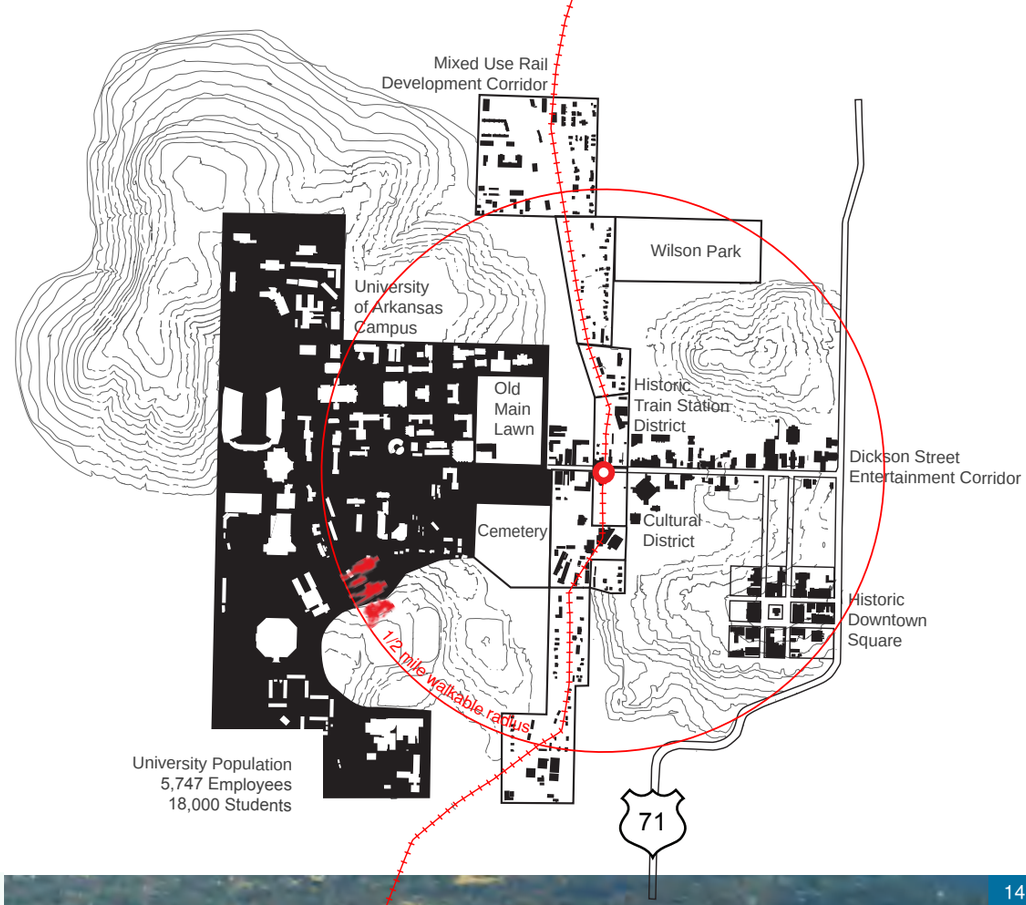
Drake Field Station



intermodal transit gateway

Dickson Street Station



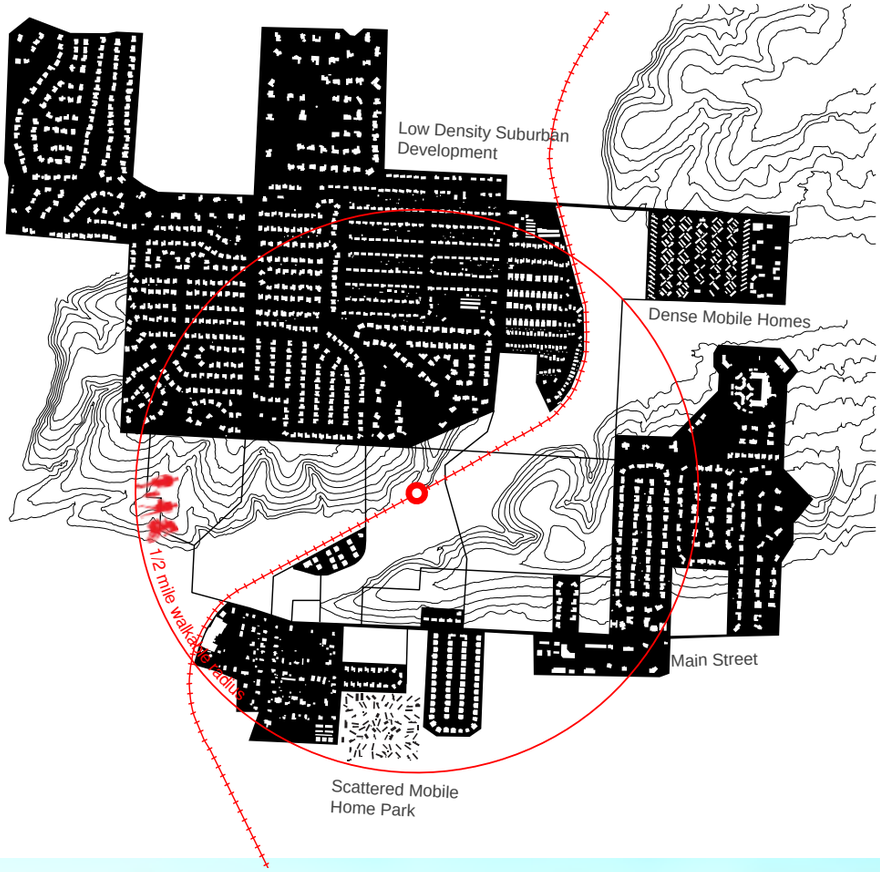


premiere statewide education and entertainment destination

NWA Mall Station

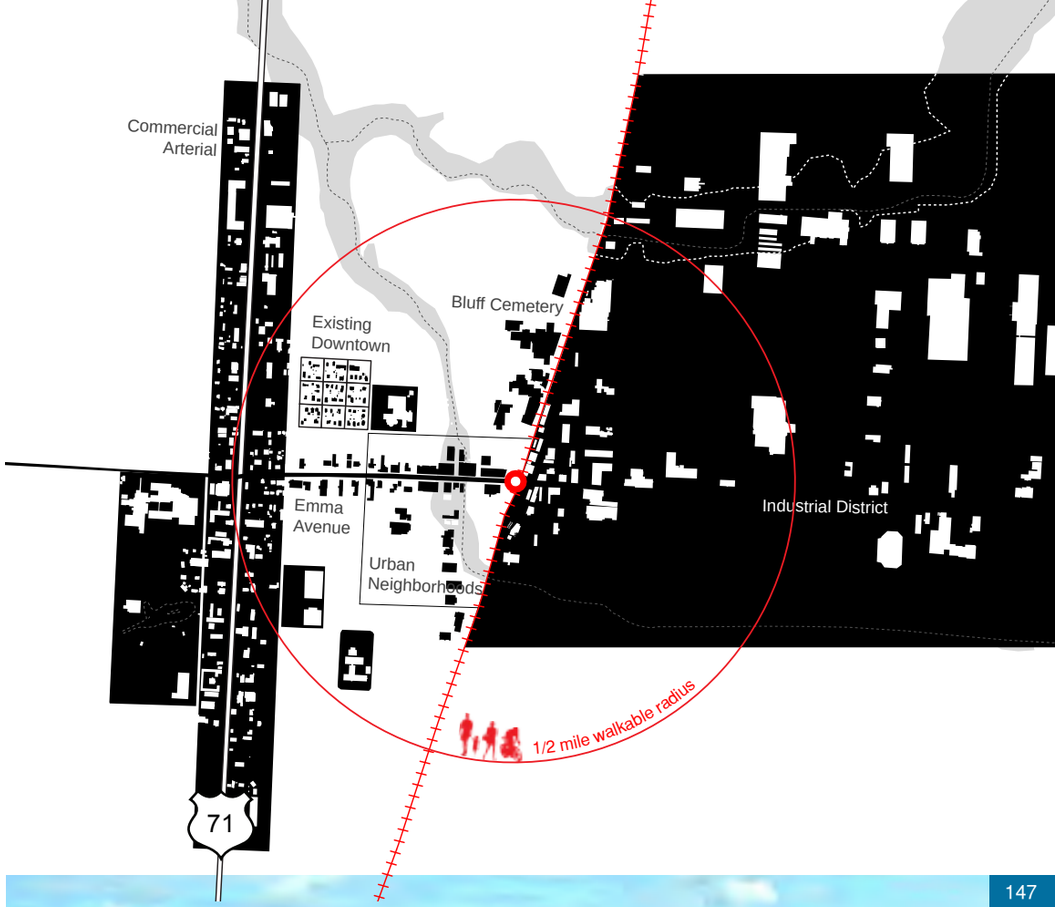
regional commercial anchor with emerging mixed uses

Johnson Station

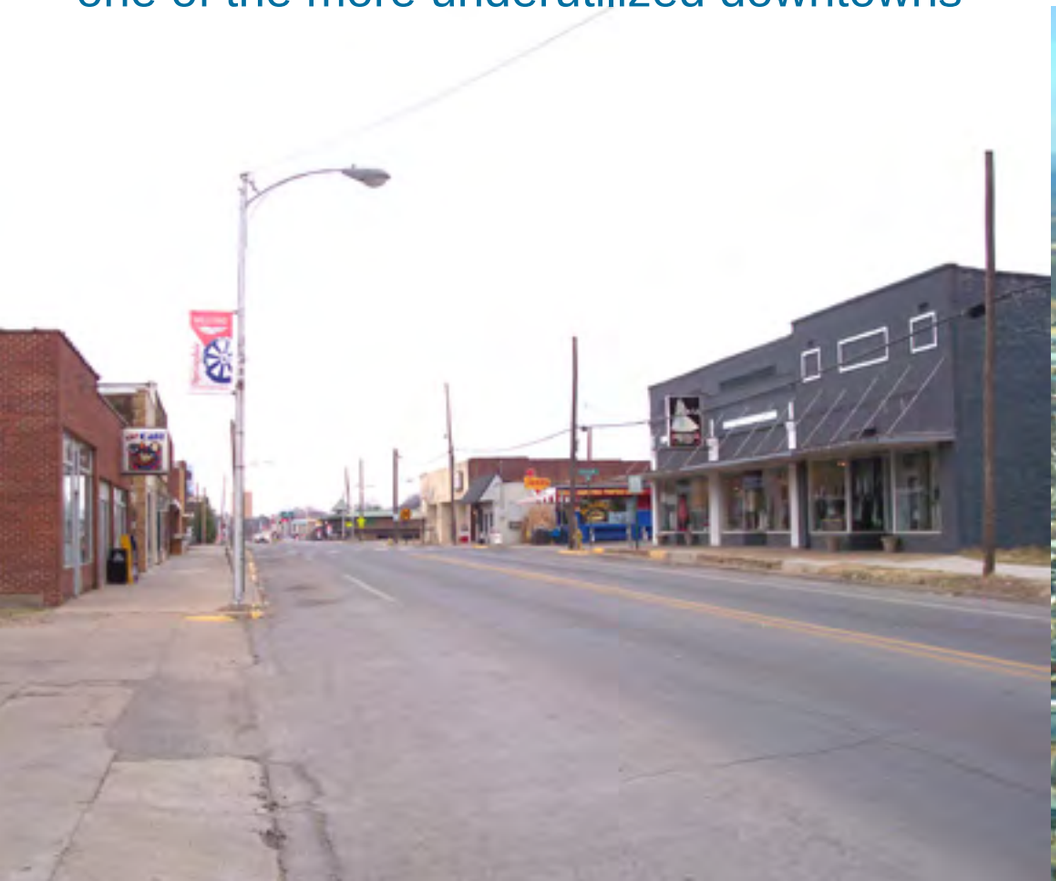


one of the fastest developing cities in NWA

Springdale Station



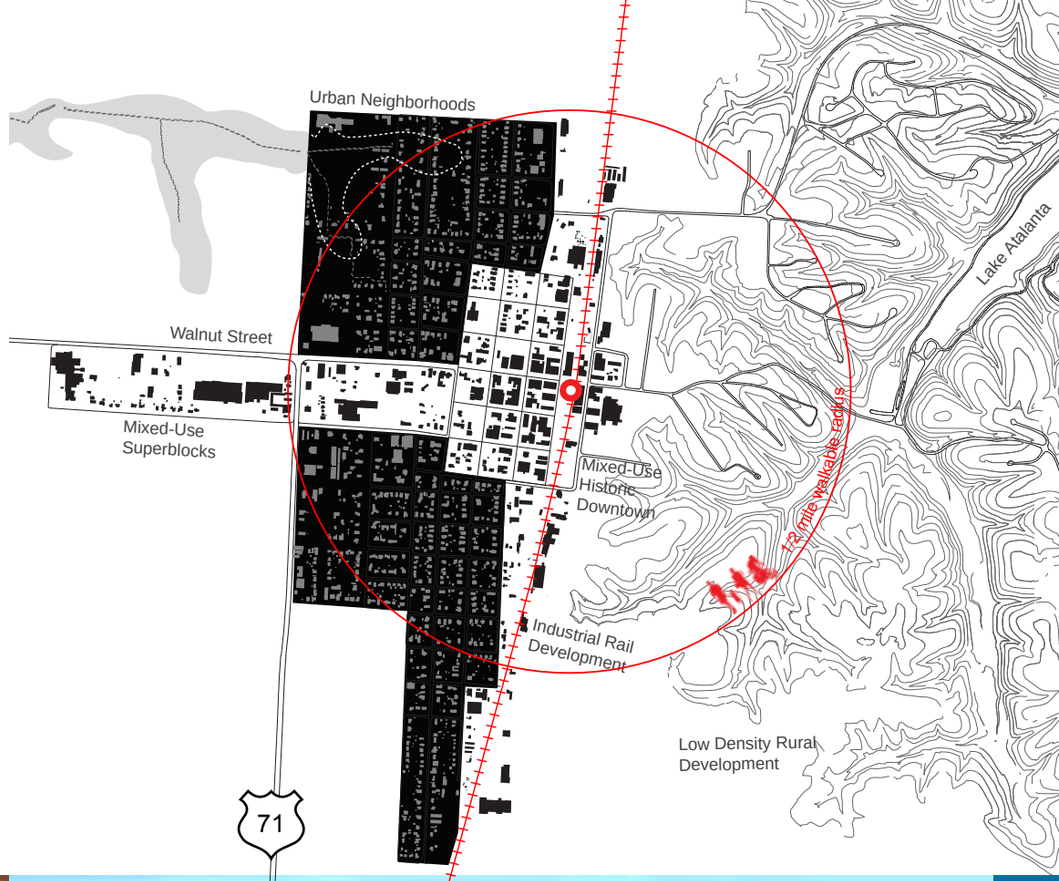
one of the more underutilized downtowns



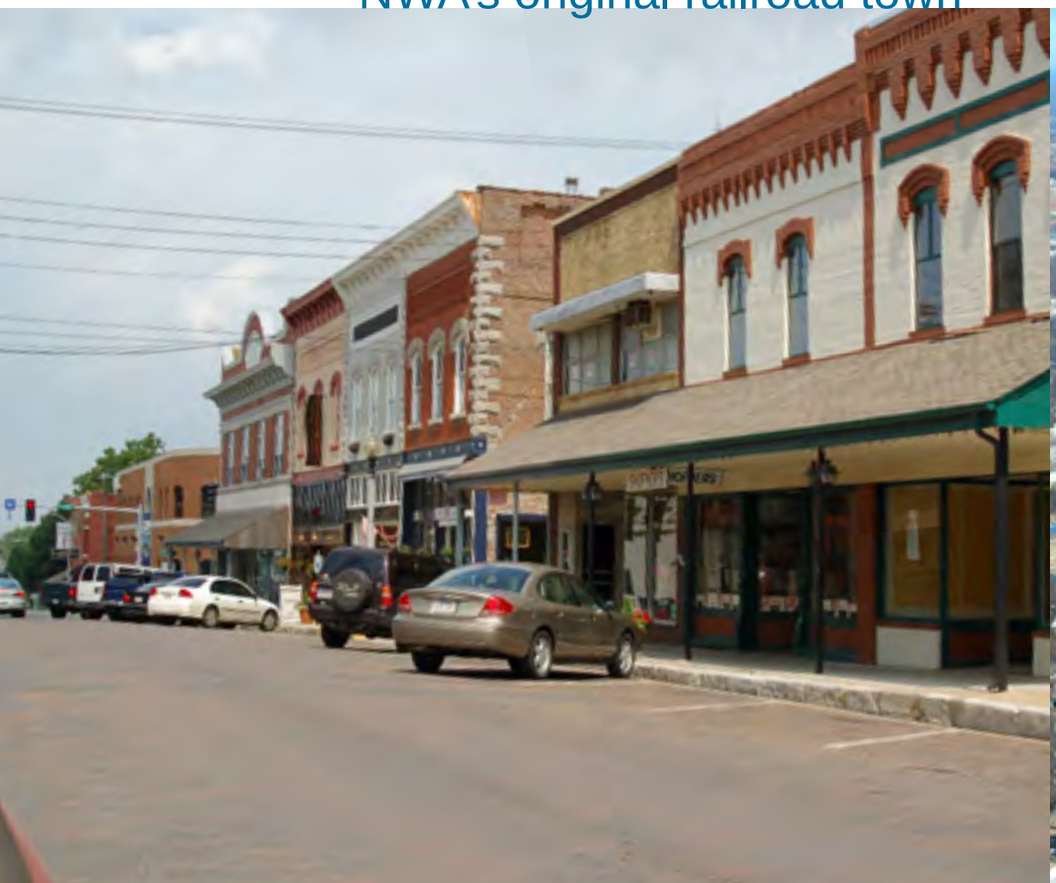
Lowell Station

an emerging greenfield city

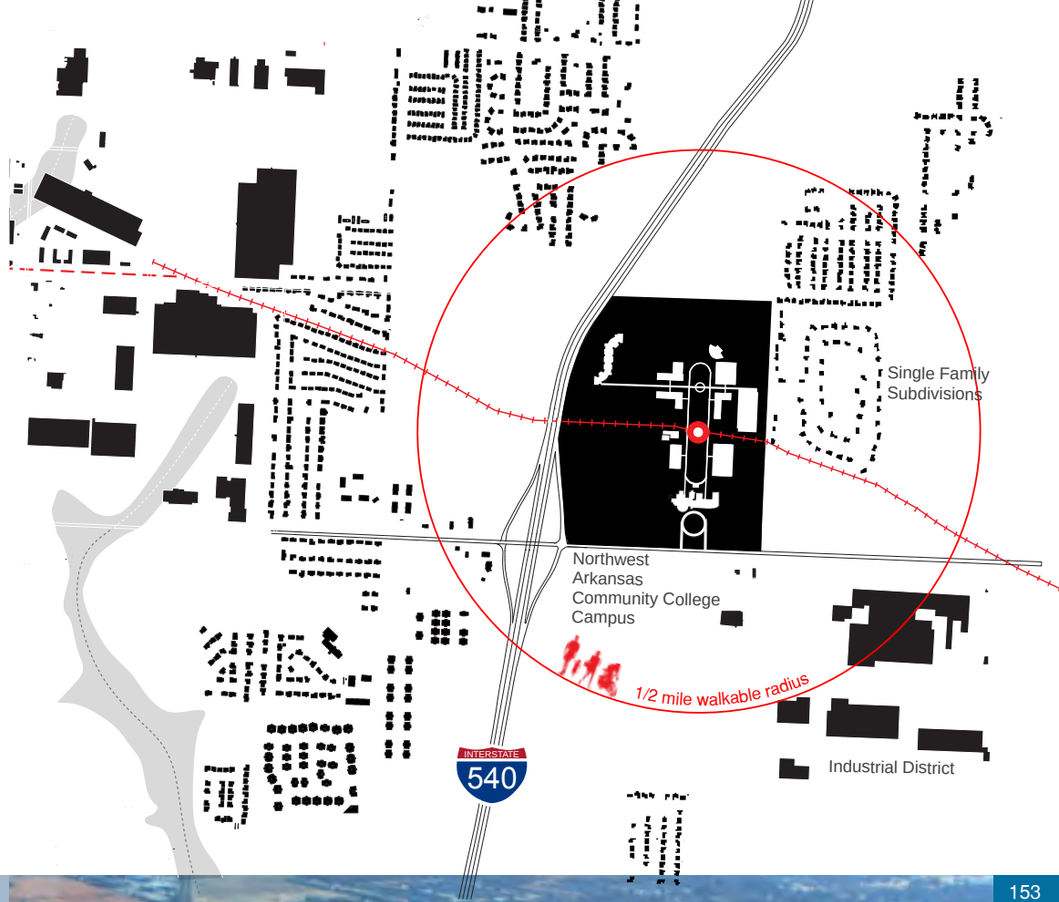
Rogers Station



NWA's original railroad town

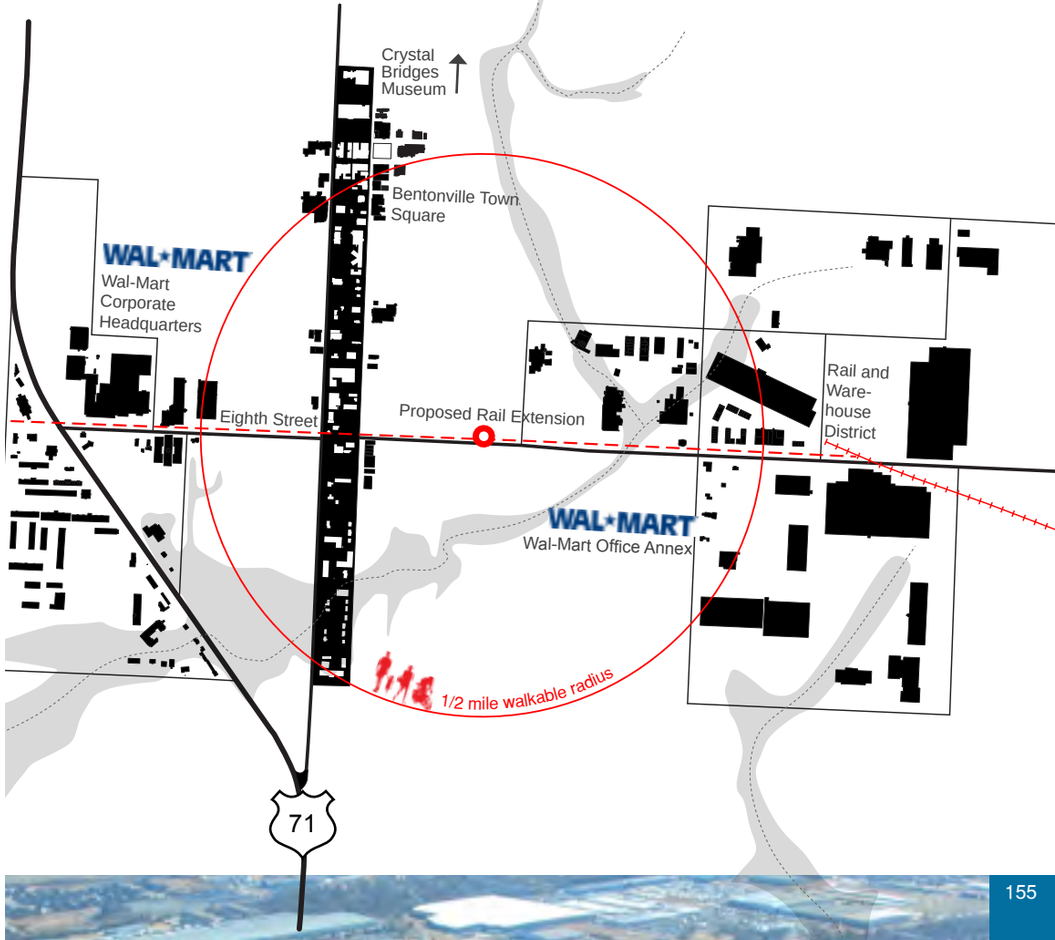


NWACC Station



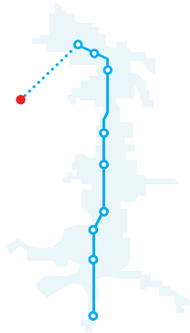
regional commuter school of 4,400

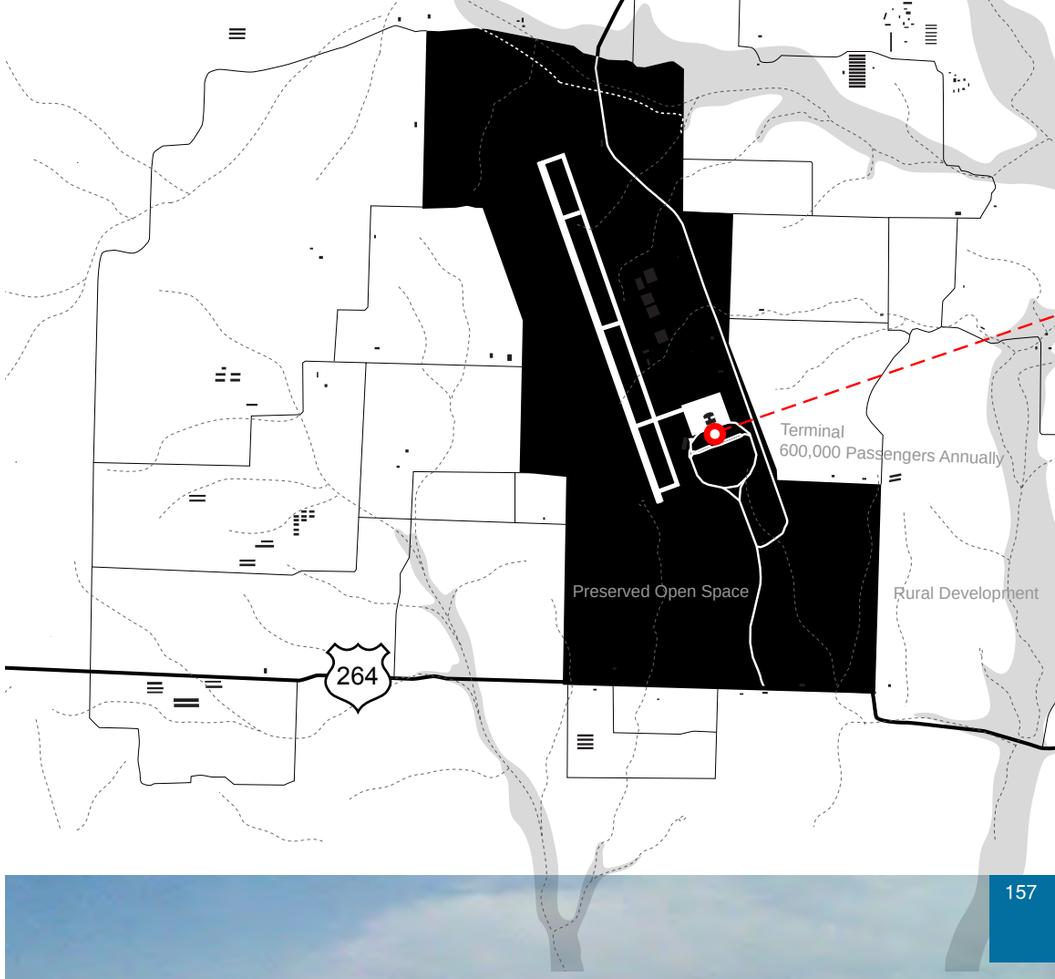
Bentonville Station



Wal-Mart Headquarters employs more than 10% of the region's population

XNA Airport Station





direct connections to 18 U.S. cities

If you are a political or business leader, facilitate funding for a NWA Rail Transit Feasibility Study and implement smart growth in our region.

Educate yourself further about land development issues and their role in determining quality of life.

If you are affiliated with the University, organize your activities or scholarship to address sustainable issues in NWA.

Speak to other groups about the importance of sustainable growth in NWA.

Support development projects with mixed uses and higher densities in NWA downtowns that are transit supportive.

If you are a civic organization, develop an official platform calling for study of rail transit feasibility.

The most important thing you can do is to let your U.S. Congress persons and Senators know of your support for further study of rail transit feasibility.

If you fill a leadership position in our region, understand what is at stake.

what you can do...

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The Rail Transit Design Studio

UACDC UNIVERSITY OF ARKANSAS COMMUNITY DESIGN CENTER

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Some rail transit projects have failed to meet their potential because they lack community-based design consideration, relying solely on transportation modeling. Many recent rail transit systems, once implemented, have experienced levels of ridership far beyond original projections and additional voter support for system extensions.

However, no contemporary urban rail transit system enjoyed political or popular support when initially proposed.

MISSION

The mission of the University of Arkansas Community Design Center is to advance creative development in Arkansas through education, research, and design solutions that enhance the physical environment.

VISION

As an outreach center of the School of Architecture, UACDC is developing a repertoire of new design methodologies applicable to community development issues in Arkansas, with currency at the national level.

UACDC design solutions introduce a multiple bottom line, integrating social and environmental measures into economic development. Integrative design solutions add long-term value and offer collateral benefits related to sustained economic capacity, enhanced ecologies, and improved public health—the foundations of creative development.

APPROACH

Expanding the Consideration of Civic Space
The contemporary public domain has shifted to an expanded urban field that includes suburban and other non-urban environments—a geography of sprawl. Compounded by the decline of traditional downtowns, this shift poses new planning challenges for which no adequate civic development models exist.

Our planning approaches are tailored for historic downtowns, rural sites, watersheds, highway/rail infrastructure, the college campus, retail environments, and the office/residential/retail subdivision.

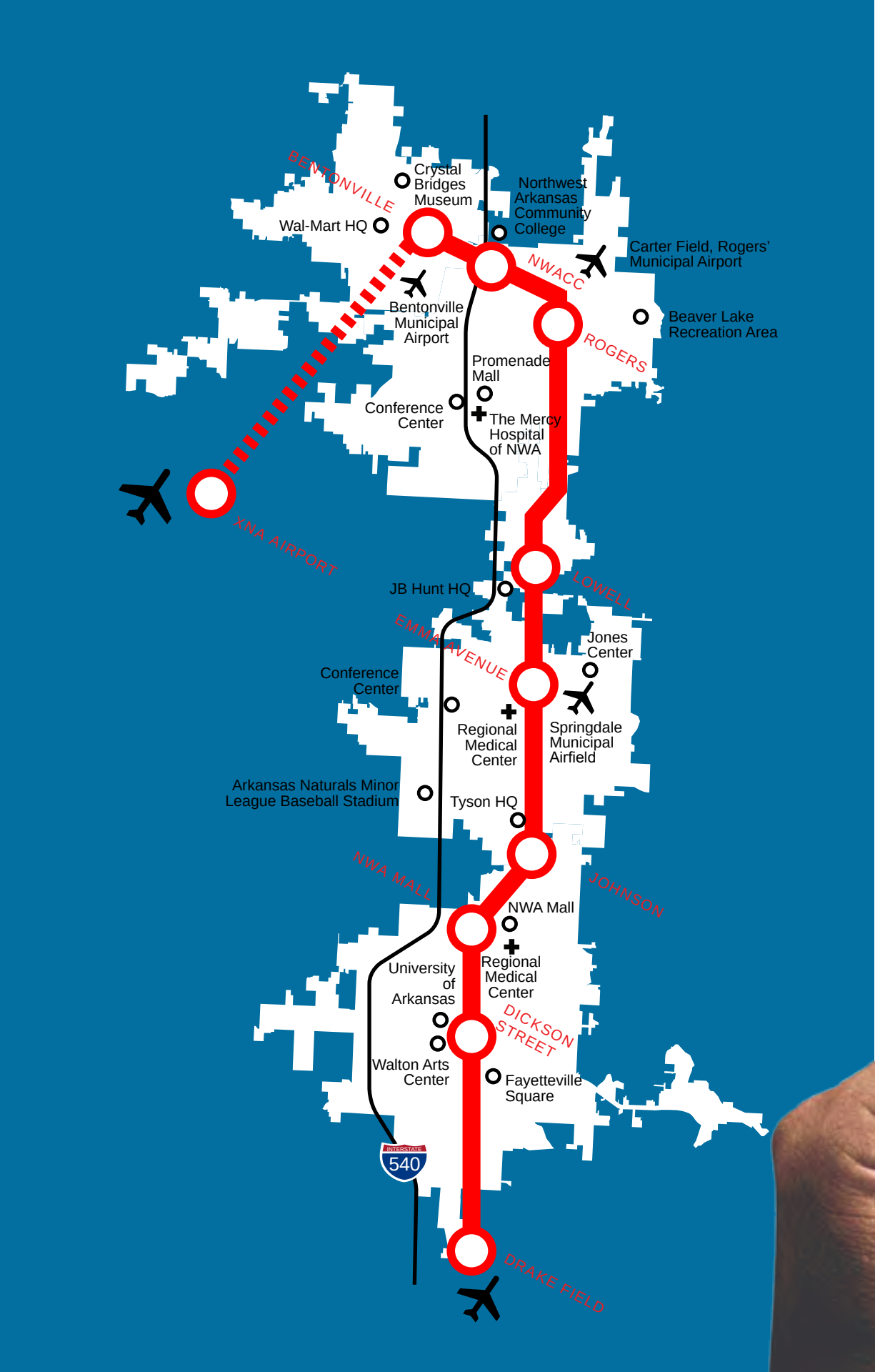
Developing New Models of Design
Through meta-disciplinary research and design principles, UACDC combines ecological, architectural, landscape architectural, and urban design solutions to address emerging planning challenges. Our research maps the unique economic, political, and cultural processes that have shaped the Arkansas landscape.

Our work addresses new challenges in affordable housing, urban sprawl, environmental planning, and management of regional growth or decline.

Constructing Discourse
Design professionals, educators, and students seeking civic design experience staff the UACDC. We collaborate with other agencies such as the Biological and Agricultural Engineering Department, the Center for Business and Economic Research, the Arkansas Natural Resources Commission, and the Arkansas Forestry Commission. Through work with our clients and collaborators, we initiate learning networks that facilitate creative development.

IMPACT

UACDC was founded in 1995 and has provided design and planning services to over 30 communities across Arkansas. Our planning has helped Arkansas communities to secure nearly $64 million in grant funding to enact suggested improvements.


BENTONVILLE
Crystal Bridges Museum
Wal-Mart HQ
Northwest Arkansas Community College
NWACC
Carter Field, Rogers' Municipal Airport
Bentonville Municipal Airport
Beaver Lake Recreation Area
ROGERS
Promenade Mall
Conference Center
The Mercy Hospital of NWA
XNA AIRPORT
JB Hunt HQ
LOWELL
EMMA AVENUE
Jones Center
Conference Center
Regional Medical Center
Springdale Municipal Airfield
Arkansas Naturals Minor League Baseball Stadium
Tyson HQ
NWA MALL
JOHNSON
NWA Mall
Regional Medical Center
University of Arkansas
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