I-93 Transit Investment Study:

Transit + Policy + Development

CTAP: 2007 Growth Management Training Conference

September 29, 2007

Manchester, New Hampshire

Kenneth S. Kinney

Julia Suprock

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Agenda

- Transit Alternatives
- Land Use Policy Evaluation
- Station Area Plans

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I-93 Transit Investment Study

Phase 1

- Previous studies
- Existing conditions
- Purpose & need
- Conceptual alternatives

Phase 2

- Land use policy
- Evaluation criteria
- Alternatives
- Impacts
- Public Meetings
- Transit-oriented development
- Final alternatives

Phase 3

- Strategic implementation plan
- Public meeting

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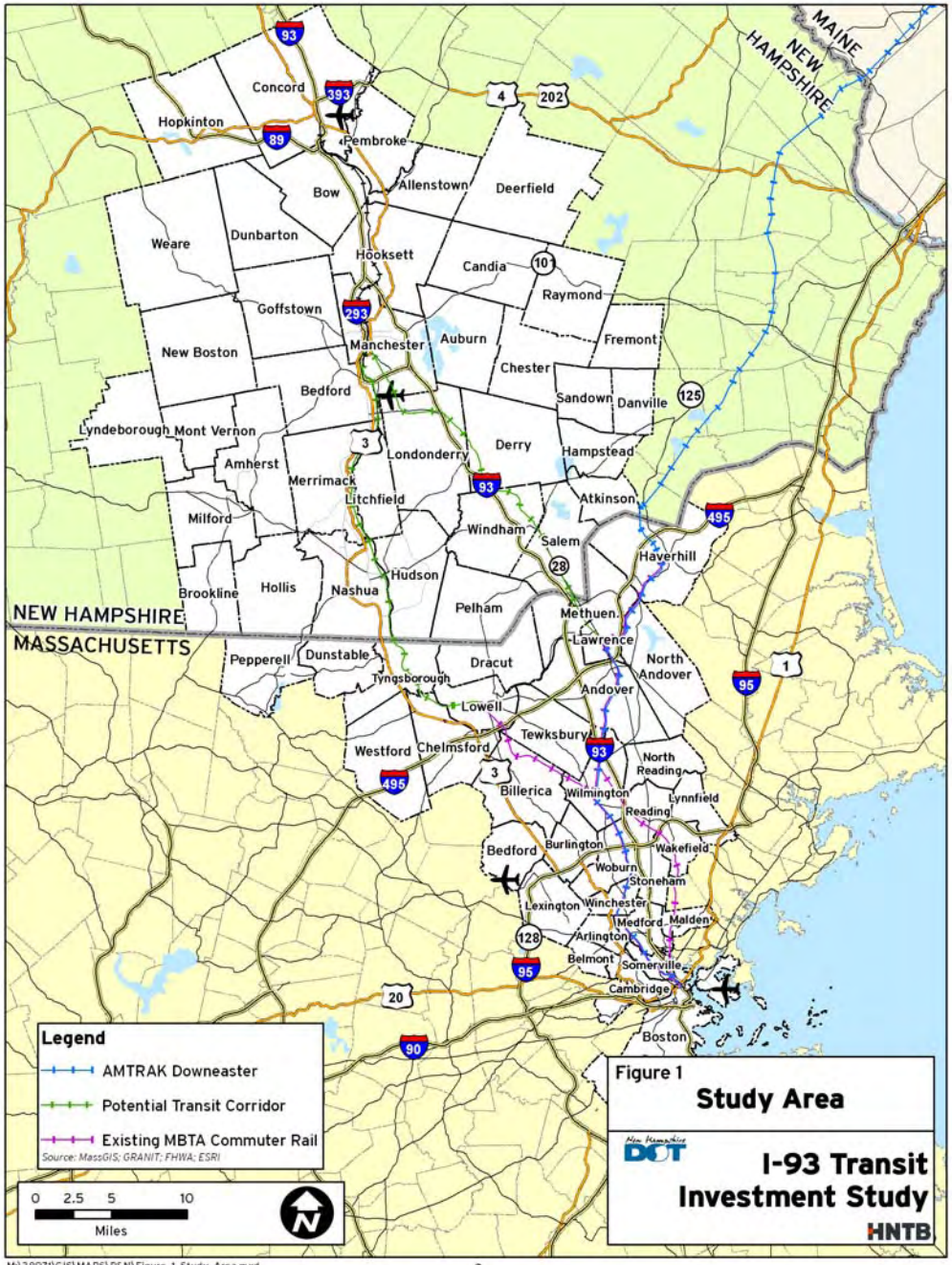
MAINE
NEW HAMPSHIRE
NEW HAMPSHIRE
MASSACHUSETTS
Concord
Hopkinton
Pembroke
Bow
Allenstown
Deerfield
Weare
Dunbarton
Hooksett
Candia
Raymond
Goffstown
Manchester
Auburn
Fremont
New Boston
Chester
Bedford
Sandown
Danville
Lyndeborough
Mont Vernon
Londonderry
Derry
Hampstead
Amherst
Merrimack
Litchfield
Atkinson
Milford
Windham
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Haverhill
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Brookline
Hollis
Nashua
Pelham
Methuen
Lawrence
Pepperell
Dunstable
Dracut
North Andover
Tyngsborough
Andover
Lowell
Tewksbury
Westford
Chelmsford
North Reading
Billerica
Wilmington
Lynnfield
Reading
Burlington
Wakefield
Bedford
Woburn
Stoneham
Lexington
Winchester
Medford
Malden
Arlington
Belmont
Somerville
Cambridge
Boston
Legend
AMTRAK Downeaster
Potential Transit Corridor
Existing MBTA Commuter Rail
Source: MassGIS; GRANIT; FHWA; ESRI
0 2.5 5 10
Miles
Figure 1
Study Area
New Hampshire DOT
I-93 Transit Investment Study
HNTB
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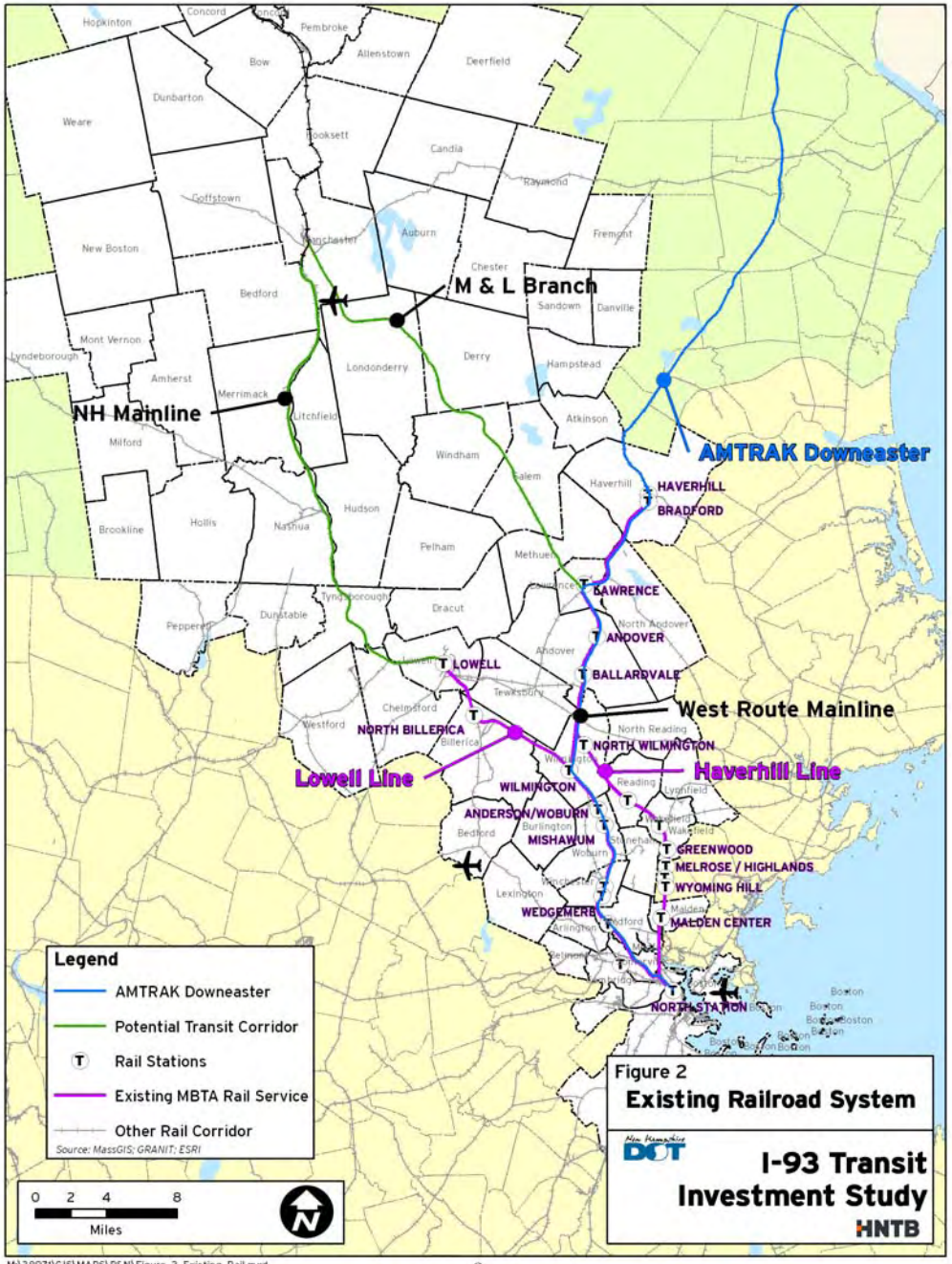

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I-93 Transit Investment Study

Problem Statement:

- Population growth in southeast New Hampshire
- Growth of metropolitan Boston
- Changing travel patterns: more long distance trips
- Transportation impacts: congestion, safety, travel times, options, investment
- Economic development impacts
- Compounded by sprawl development

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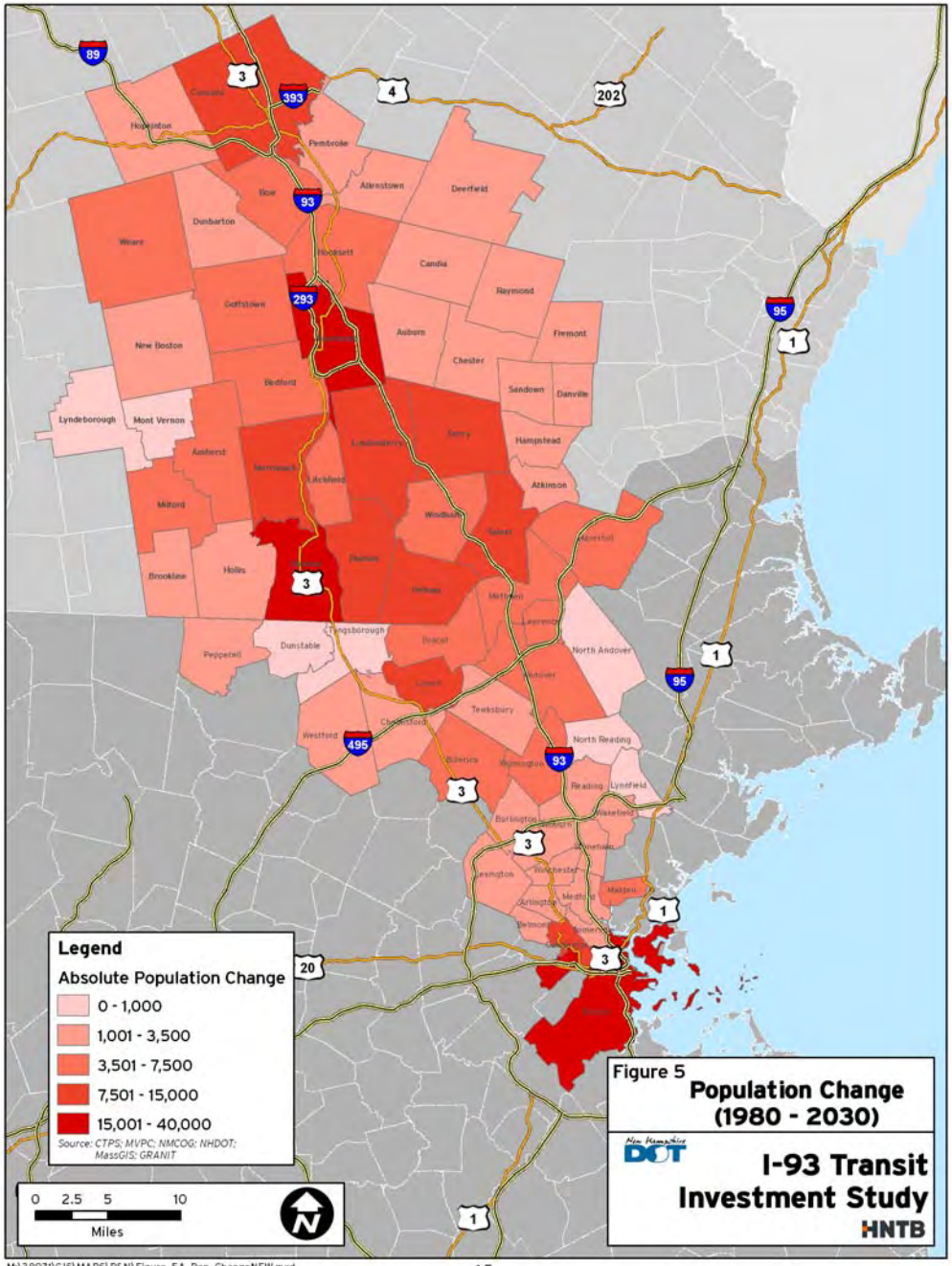
Legend
Absolute Population Change
0 - 1,000
1,001 - 3,500
3,501 - 7,500
7,501 - 15,000
15,001 - 40,000
Source: CTPS; MVPC; NMCOG; NHDOT; MassGIS; GRANIT
0 2.5 5 10
Miles
Figure 5
Population Change (1980 - 2030)
I-93 Transit Investment Study
HNTB
Pembroke
Allenstown
Deerfield
Dunbarton
Candia
Raymond
Goffstown
Auburn
Fremont
New Boston
Chester
Bedford
Sandown
Danville
Lyndeborough
Mont Vernon
Hampstead
Amherst
Atkinson
Milford
Brookline
Hollis
Tyngsborough
Dracut
North Andover
Dunstable
Pepperell
Tewksbury
Westford
North Reading
Reading
Lynnfield
Burlington
Wakefield
Lexington
Winchester
Arlington
Medford
Belmont
Malden
Everett
Revere
Lawrence
Methuen
Salem
Peabody
Danvers
Beverly
Hamilton
Ipswich
Rowley
Newbury
Amesbury
Salisbury
Seabrook
Hampton
Kingston
Plaistow
Atkinson
Windham
Salem
Haverhill
Merrimack
Litchfield
Londonderry
Derry
Hudson
Pelham
Dracut
Lowell
Chelmsford
Billerica
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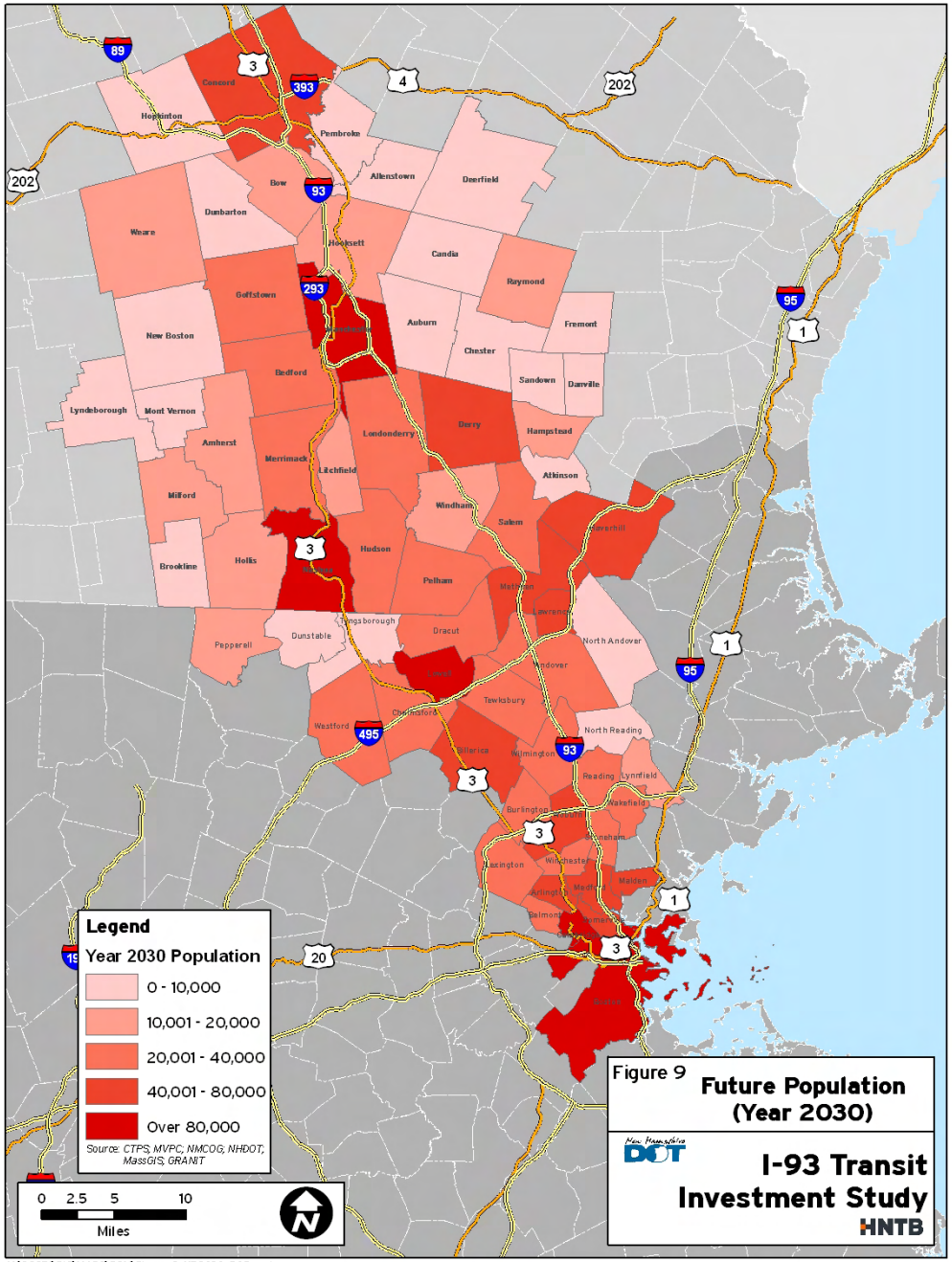
Belmont
Malden
Everett
Revere


Legend
Year 2030 Population
0 - 10,000
10,001 - 20,000
20,001 - 40,000
40,001 - 80,000
Over 80,000
Source: CTPS, MVPC, NMCOG, NHDOT, MassGIS, GRANIT
0 2.5 5 10
Miles
Figure 9
Future Population (Year 2030)
I-93 Transit Investment Study
HNTB
Concord
Hopkinton
Pembroke
Allenstown
Deerfield
Bow
Dunbarton
Weare
Hooksett
Candia
Raymond
Goffstown
Auburn
Fremont
New Boston
Chester
Bedford
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Wakefield
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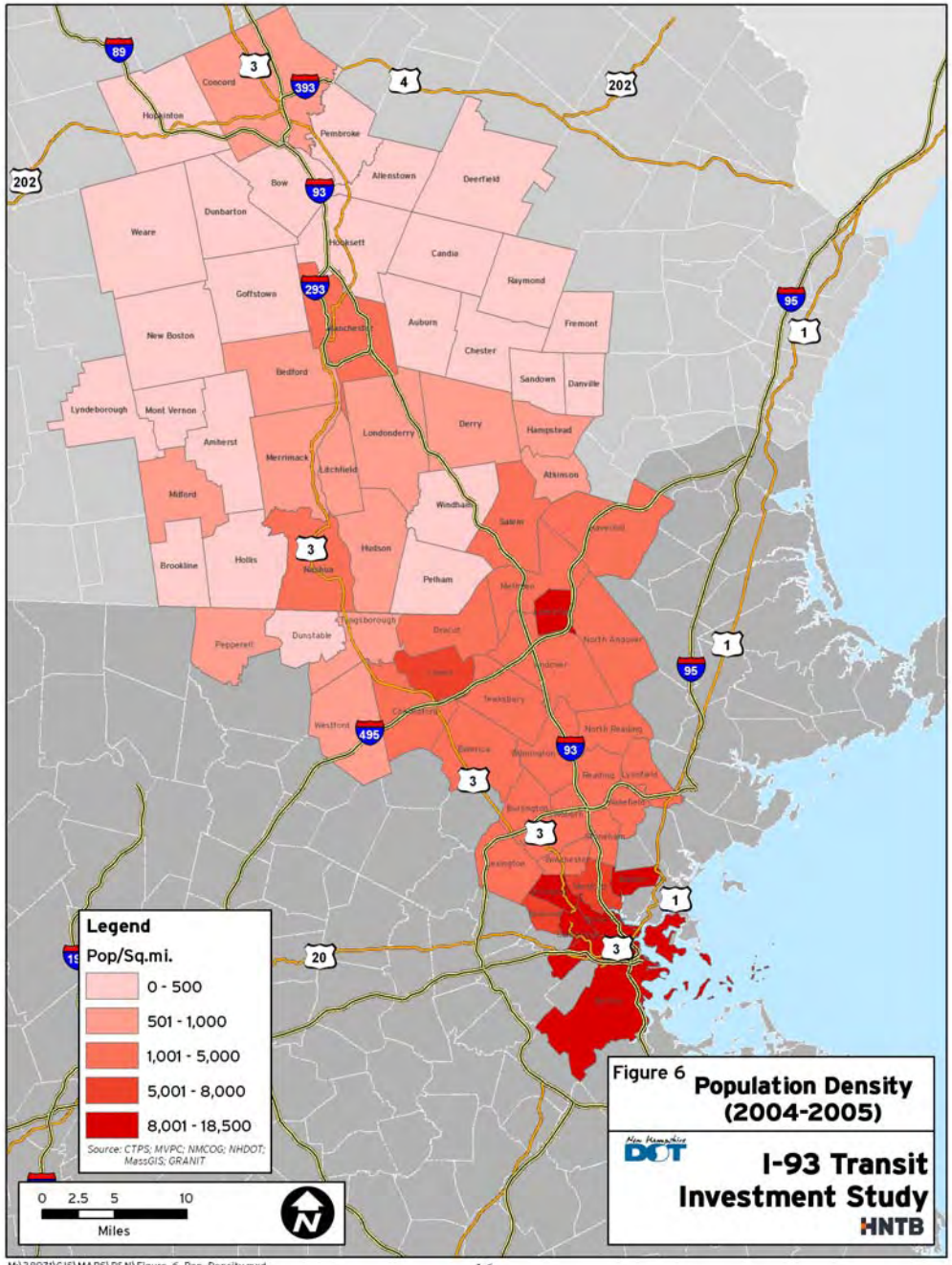
Legend
Pop/Sq.mi.
0 - 500
501 - 1,000
1,001 - 5,000
5,001 - 8,000
8,001 - 18,500
Source: CTPS; MVPC; NMCOG; NHDOT; MassGIS; GRANIT
0 2.5 5 10
Miles
Figure 6
Population Density (2004-2005)
I-93 Transit Investment Study
HNTB
Concord
Hopkinton
Pembroke
Allenstown
Deerfield
Bow
Dunbarton
Weare
Hooksett
Candia
Raymond
Goffstown
Auburn
Fremont
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Pelham
Tyngsborough
Dunstable
Pepperell
North Andover
Westford
North Reading
Burlington
Reading
Lynnfield
Wakefield
Woburn
Winchester
Lexington
Medford
Boston
Hanscom
Hanscom Field
Nashua Airport
Lawrence Airport
Lowell Airport
Manchester Airport
Boston Logan Airport
Boston Logan Airport
Boston Logan

Tier 1 Alternatives

Rail Alternatives

- Two Eastern Alignment
- Two Highway Alignment

Bus Alternative

- Shoulder Alternative

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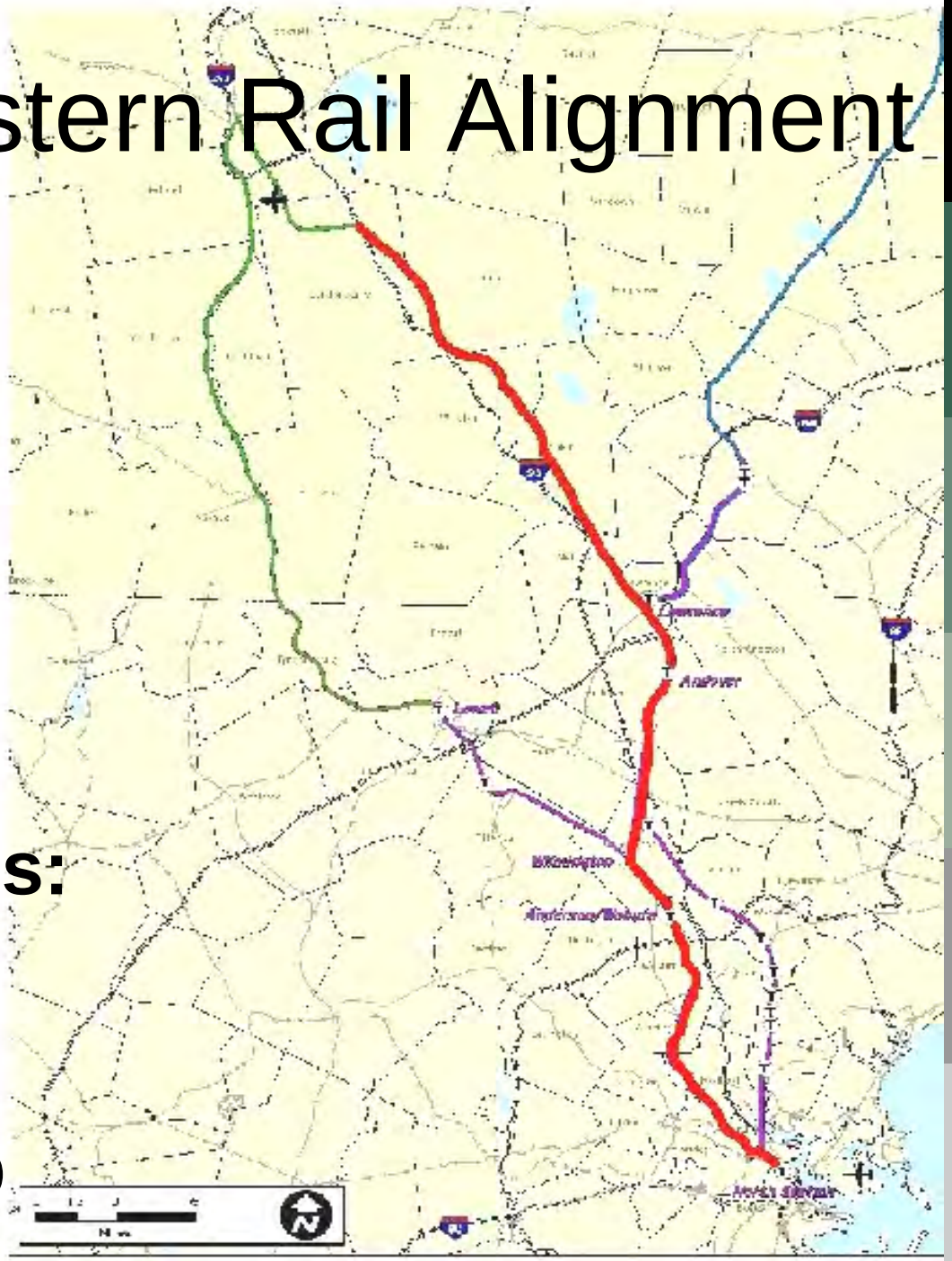
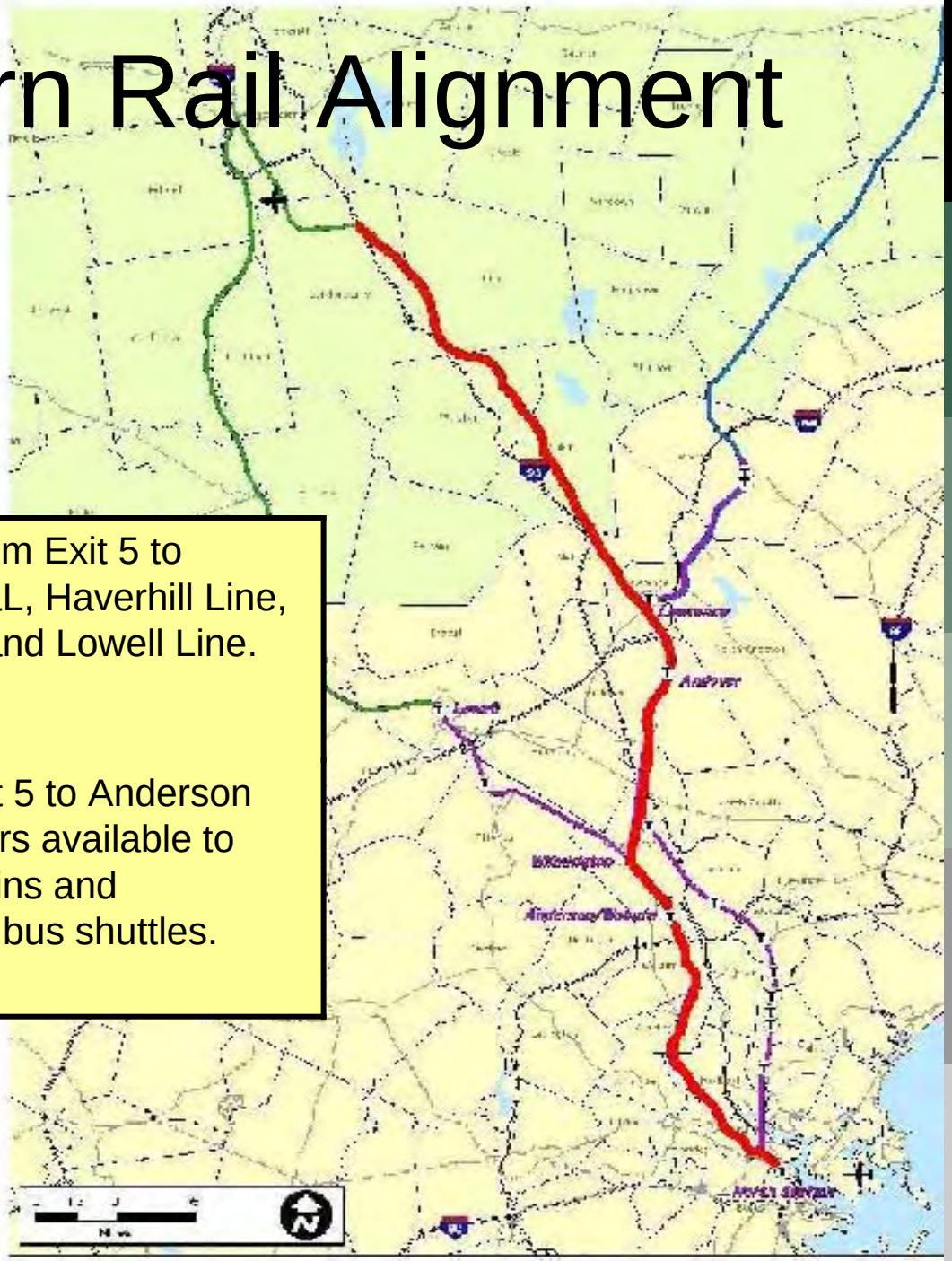
About the Eastern Rail Alignment

- **In NH:**
  - M&L Branch
- **In MA:**
  - Haverhill line
  - Wildcat branch
  - Lowell line
- **Five new stations:**
  - Exit 5
  - Derry
  - Salem
  - Methuen
  - Lawrence (Essex Street)



Tier 1: Eastern Rail Alignment

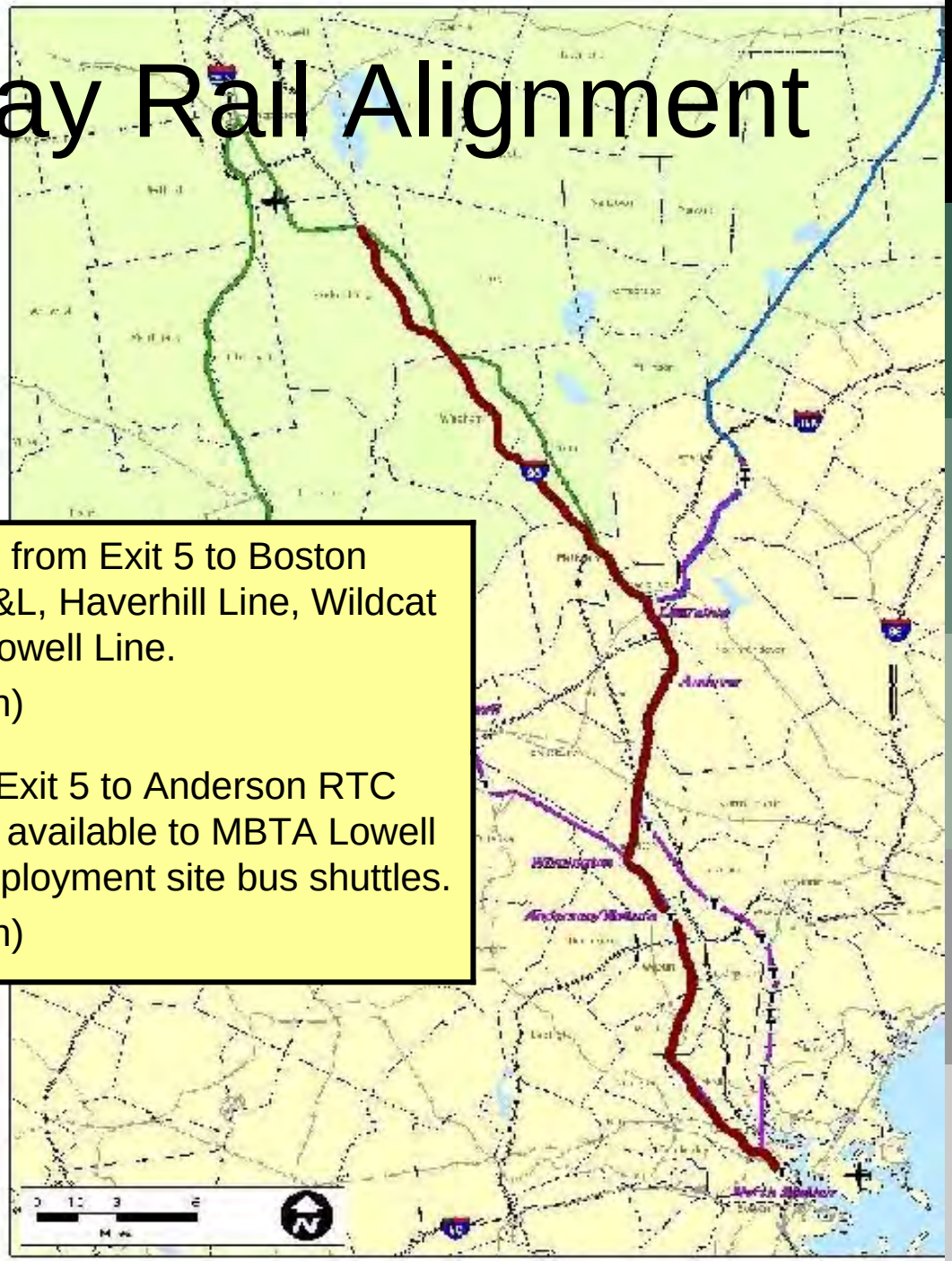
ERB	**Boston Service**	Direct service from Exit 5 to Boston using M&L, Haverhill Line, Wildcat Branch and Lowell Line. (47 mi /71 min)
ERA	**Anderson Service**	Service from Exit 5 to Anderson RTC with transfers available to MBTA Lowell trains and employment site bus shuttles. (47 mi /82 min)



About the Highway Rail Alignment

- **In NH:**
  - I-93 Transit Reservation
- **In MA:**
  - M&L
  - Haverhill line
  - Wildcat branch
  - Lowell line
- **Six new stations:**
  - Exit 5
  - Exit 4
  - Exit 3
  - Exit 2
  - Methuen
  - Lawrence (Essex Street)

Tier 1: Highway Rail Alignment



HRB	**Boston Service**	Direct service from Exit 5 to Boston using I-93, M&L, Haverhill Line, Wildcat Branch and Lowell Line. (47 mi /73 min)
HRA	**Anderson Service**	Service from Exit 5 to Anderson RTC with transfers available to MBTA Lowell trains and employment site bus shuttles. (47 mi /84 min)

Rail Hours of Service and Headways

- ***Weekdays***
  - Four-car trains
  - First Arrival ~ 7 am
  - Last Departure ~ 11pm
  - 30 minutes peak
  - 60 minutes off peak

- ***Saturday, Sunday and Holidays***
  - First Arrival ~ 8 am
  - Last Departure ~ 12 am
  - Direct Boston Services = 90 min
  - Anderson Connecting Service = 120 min

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About the Shoulder Bus Alternative

- **Five offline bus terminals:**
  - Manchester (Granite Street)
  - Exit 5
  - Exit 4
  - Exit 3
  - Exit 2

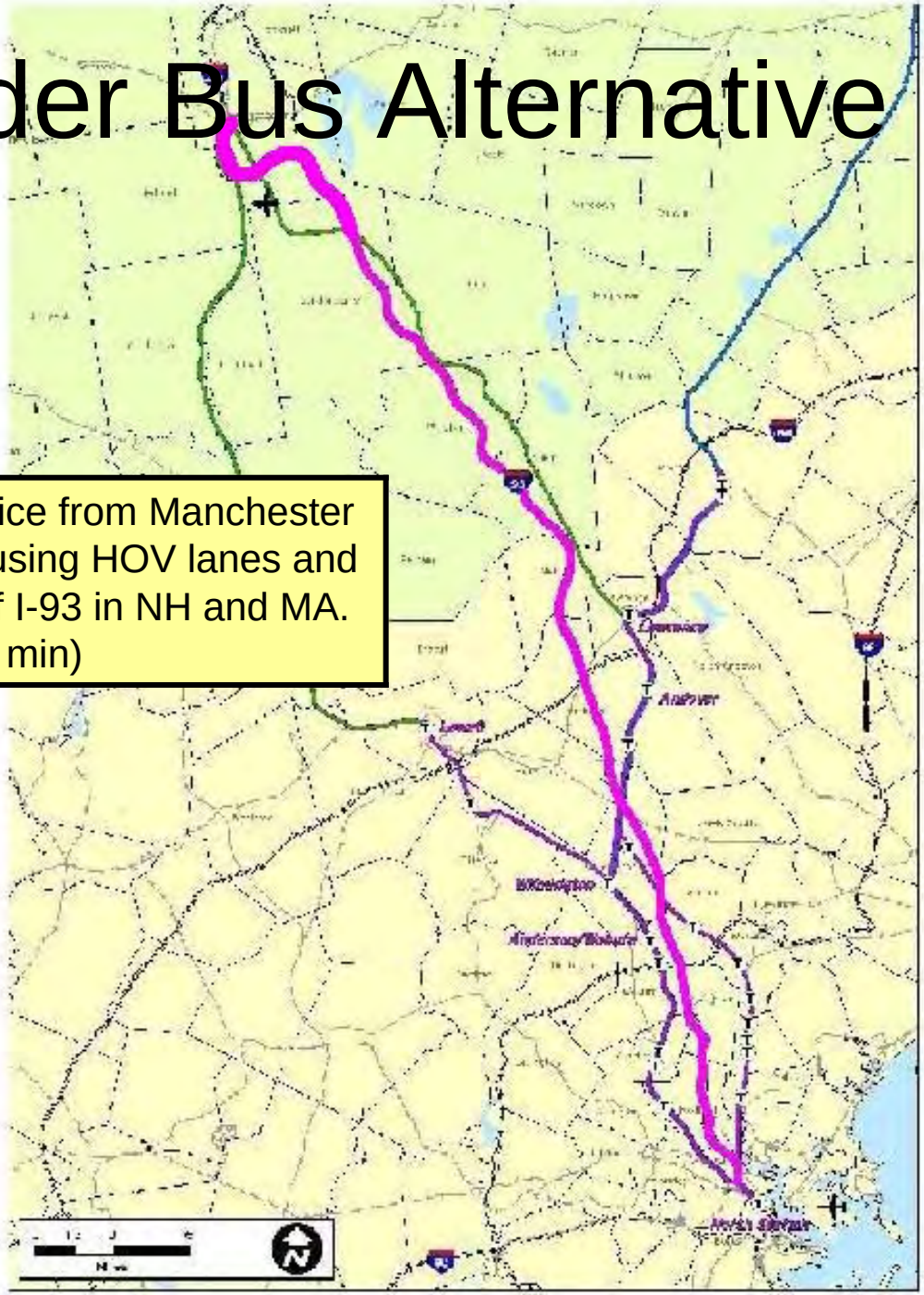
- ***Peak buses serve <u>one station</u> en route to Boston***

Shoulder Bus Routing

- **In NH:**
  - Manchester to state line
    - Shoulders of I-293 and I-93
- **In MA:**
  - State line to Exit 30
    - Shoulder of I-93
  - Exit 30 to Boston
    - Existing HOV Lane

Tier 1: Shoulder Bus Alternative

HBBS	**Boston Service**	Direct service from Manchester to Boston using HOV lanes and shoulder of I-93 in NH and MA. (55 mi / 56 min)



Shoulder Bus Service Hours & Headways

- ***Weekdays***
  - First Arrival ~ 7 am
  - Last Departure ~ 11pm
  - 15 to 30 minutes peak
  - 60 minutes off peak

- ***Saturday, Sunday and Holidays***
  - First Arrival ~ 8 am
  - Last Departure ~ 12 am
  - Direct Boston Services = 90 min

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Evaluation Criteria

- Capital cost
- Ridership forecasts
- Impacts on I-93 travel conditions
- User benefits (travel time / cost savings)
- Mode shift
- Land use / development impacts
- Environmental impacts
- Public support

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Key Issues

- M&L branch
- Manchester Airport
- New Hampshire mainline
- Massachusetts
- Land use
- Financing

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Federal Requirements

- Cost effectiveness
- Land use
- Financing

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Rail and Bus TOD

- 91% of TODs are rail-based; 8% are bus-based

Rail TOD	Bus TOD
• fixed route encourages development • greater opportunity for joint development • larger impact on land use • proven track record of success • attracts “choice” riders • comparatively expensive	• flexibility for route deviation • cost effective • can serve dispersed areas • perceived as “second class” mode • “too” flexible for developers • shorter track record of success

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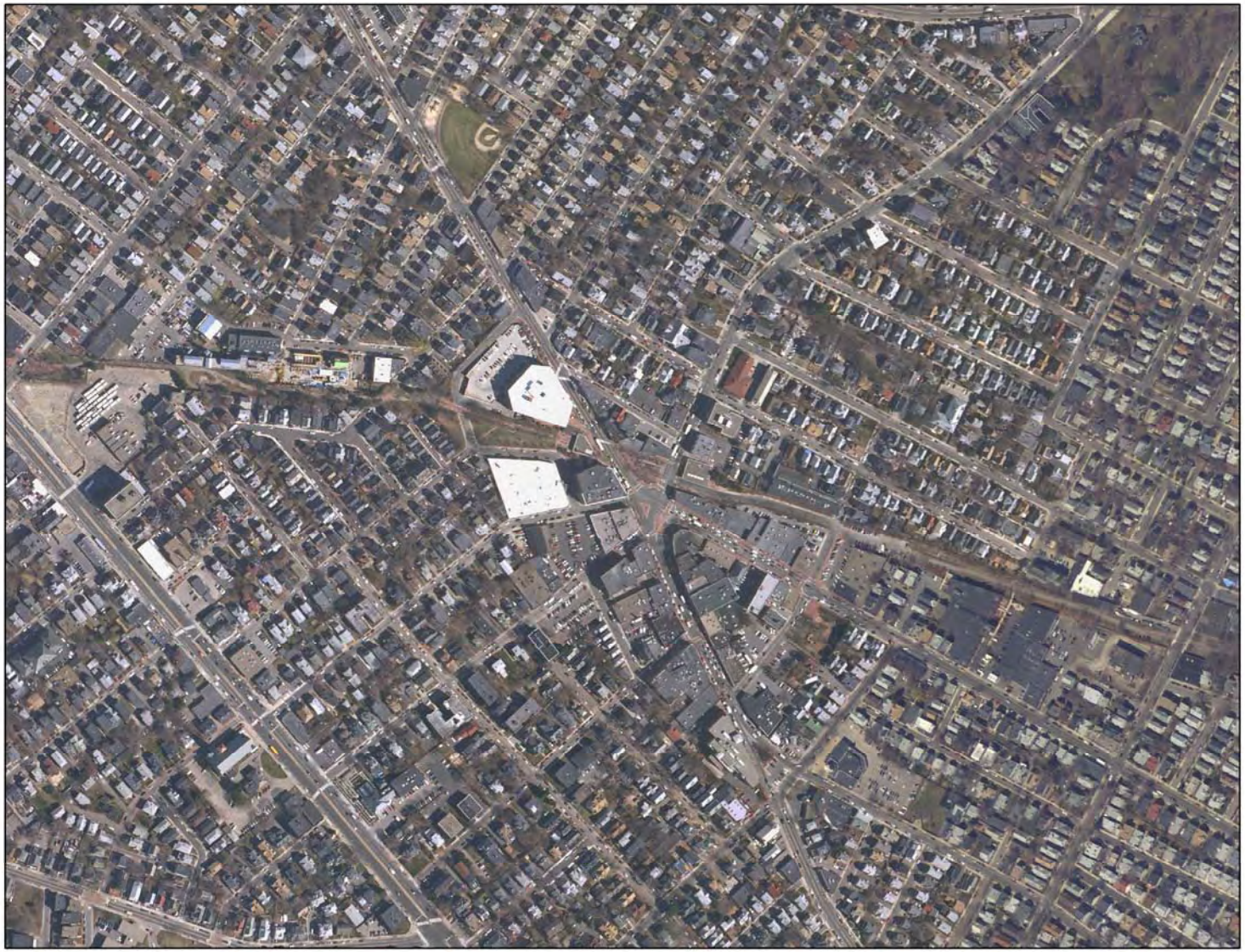
Somerville, MA (Davis Square)



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Middleton, WI

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TOD Tools

- Station Area Zoning
- District Boundaries
- Mix of Uses
- Development Density and Intensity
- Regulatory and Policy Incentives
- Design Guidelines
- Parking
- Housing affordability

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Station Area Zoning

- **Best practices:**
  - Allow the creation of TOD zones
    - **Base zones:** traditional zoning tool
    - **Overlay zones:** control without complexity
    - **Floating zones:** specific to development

Seattle, WA: McClellan station. Source: http://www.seattle.gov/transportation/ppmp_sap_home.htm

- **National models:**
  - **Seattle, WA**
    - Station Area Planning Program
  - **Portland, OR**
    - Light Rail Transit Station overlay zones
  - **Minneapolis, MN**
    - Hiawatha Corridor light rail transit station areas

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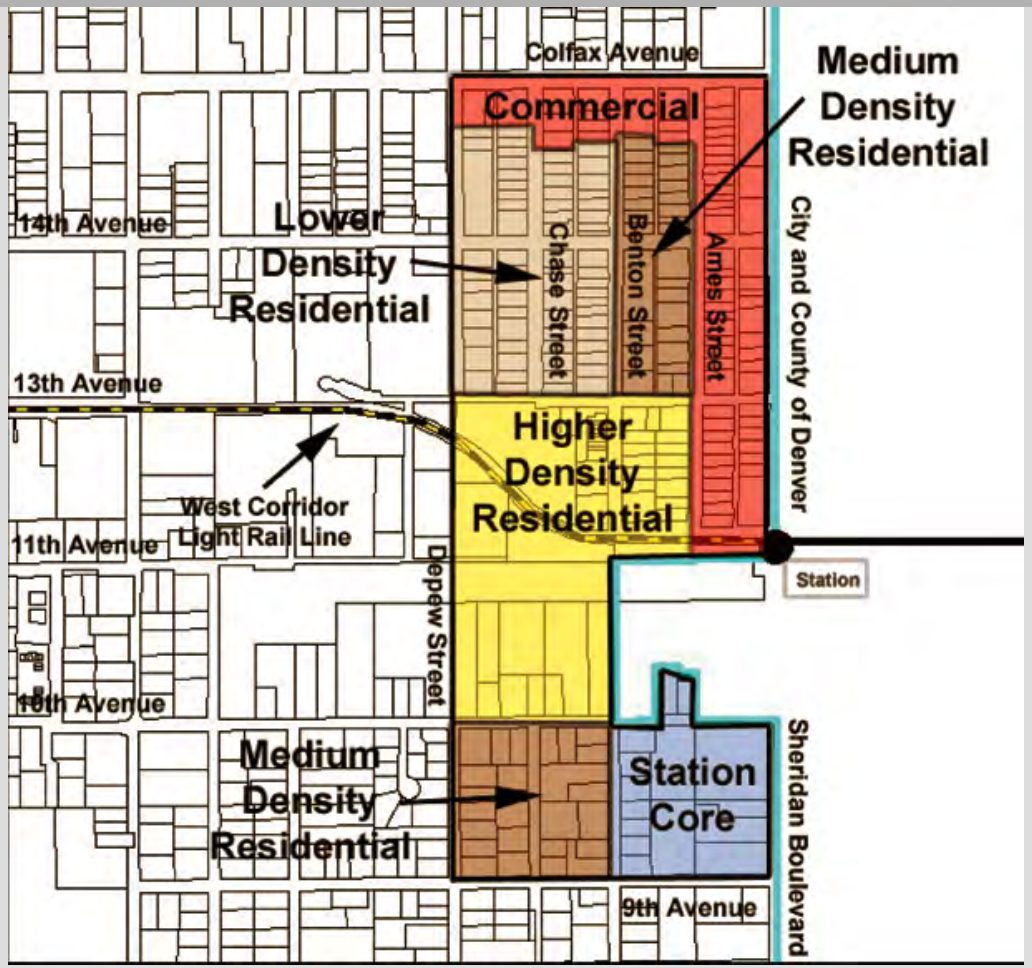
District Boundaries

- **Best practices:**
  - Half- to quarter-mile of station
  - Gradate intensity
- **National model:**
  - **Lakewood, CO:**
    - West Corridor Light Rail Station Area Planning



Source: City of Lakewood, CO. Sheridan Boulevard Station Area Plan, November 2006.

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Mix of Uses

- **Best practices:**
  - Commercial core with residential use
  - Mix varies by station type:
    - Regional, district, and developing neighborhood

- **National models:**
  - **San Diego, CA**
    - Encourages village greens and plazas
  - **Gresham, OR**
    - Creates four zones around each station
  - **Seattle, WA**
    - Allows light industrial uses
  - **Tacoma, WA**
    - Combines mix of uses with design and engineering guidelines

Central Fountain at the Promenade, Rio Vista West, San Diego.
Source: http://www.tndwest.com/riovistawest.html

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Development Density and Intensity

- **Best practices:**
  - Density is most important in creating ridership
  - Mix of residential types
  - Employment density is critical

- **National models:**
  - **San Diego, CA**
    - Minimum and maximum densities
  - **Huntersville, NC**
    - TOD-R and TOD-E districts
  - **Denver, CO**
    - Transit mixed-use district

Village at Arapahoe Station, Denver, CO. Source: Transit Oriented Development Status Report, RTA, November 2005.

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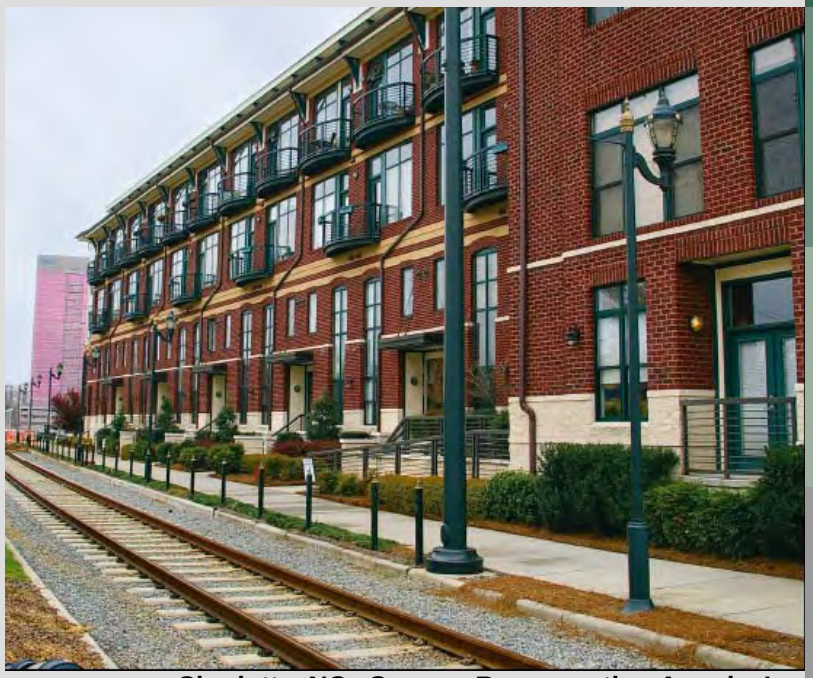
Regulatory and Policy Incentives

- **Best practices:**
  - Incentives are key to overcoming TOD developmental obstacles
  - Regulatory clarity and stability
  - Relevant incentives

- **National models:**
  - **Somerville, MA**
    - Infrastructure improvements, site acquisition
  - **Charlotte, NC**
    - TOD Response Team
  - **Montgomery County, MD**
    - Density bonuses for affordable housing
  - **Orlando, FL**
    - Sliding scale for impact fees



Charlotte, NC. Source: Reconnecting America's Center for Transit-Oriented Development "Realizing the Potential: Expanding Housing Opportunities near Transit."

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Design Guidelines

- **Best practices:**
  - Good design encourages transit usage
  - Advisory
  - Soften perceptions of density

- **National models:**
  - **Raleigh-Durham, NC**
    - Triangle Transit Authority guidebook
  - **San Diego, CA**
    - Transit-Oriented Development Design Guidelines
  - **Somerville, MA**
    - Design Review Overlay Districts

Davis Square, Somerville, MA. Source: www.answers.com

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Parking

- **Best practices:**
  - Parking should be most plentiful at the end of a transit line; least within the central business district
  - Park and rides can be located between stations
  - Reduced availability of parking
  - Shared and on-street parking

- **National models:**
  - **Denver, CO**
    - No requirements in downtown core; reductions available if near transit and shared
  - **Portland, OR**
    - Parking maximums for properties adjacent to rail lines

San Francisco, CA. Source: http://www.sfmta.com/cms/phome/homeparking.htm

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Housing Affordability

- **Affordability in context: what does it mean?**

- **Best practices:**
  - A diversity of housing types and prices supports a healthy community
  - Zoning can be used to encourage or require affordable housing
  - Density bonuses are used to offset developer costs

- **National models:**
  - **Renton, WA**
    - Overlake Station
  - **Atlanta, GA**
    - Lindbergh Station
  - **Los Angeles, CA**
    - Density bonus

Overlake Station, Renton, WA. Source: www.metrokc.gov

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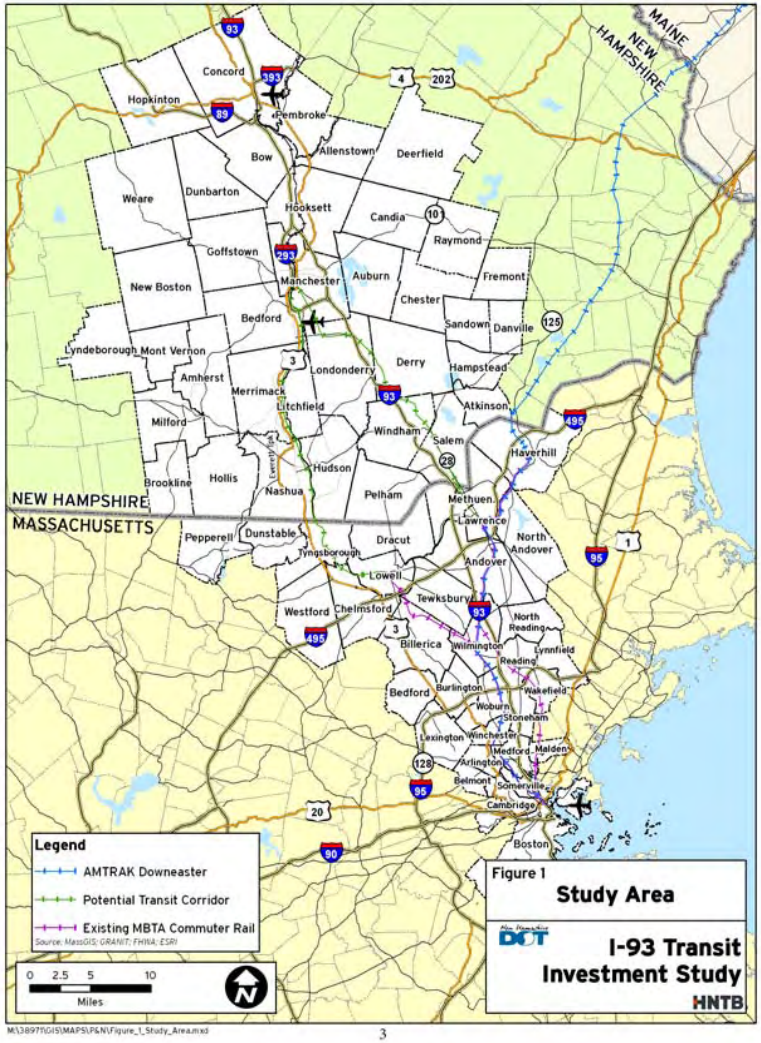
Land Use Analysis:
Communities Studied



New Hampshire:

- Bedford
- **Derry**
- Hudson
- Litchfield
- **Londonderry**
- **Manchester**
- Merrimack
- Nashua
- **Salem**
- **Windham**

Massachusetts:

- Andover
- Lawrence
- **Methuen**
- Tewksbury
- Wilmington
- Woburn

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Land Use Policy Analysis:
New Hampshire and Massachusetts

- Variety of development patterns and population densities

- Some common goals of master plans:
  - Preservation of open space
  - Affordable housing
  - Reduced traffic
  - Elimination of sprawl development

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Land Use Policy Analysis:
New Hampshire and Massachusetts

- **Common constraints:**
  - Physical infrastructure: water and sewer
  - Planning and zoning personnel
  - Political will
  - Cross-municipal coordination

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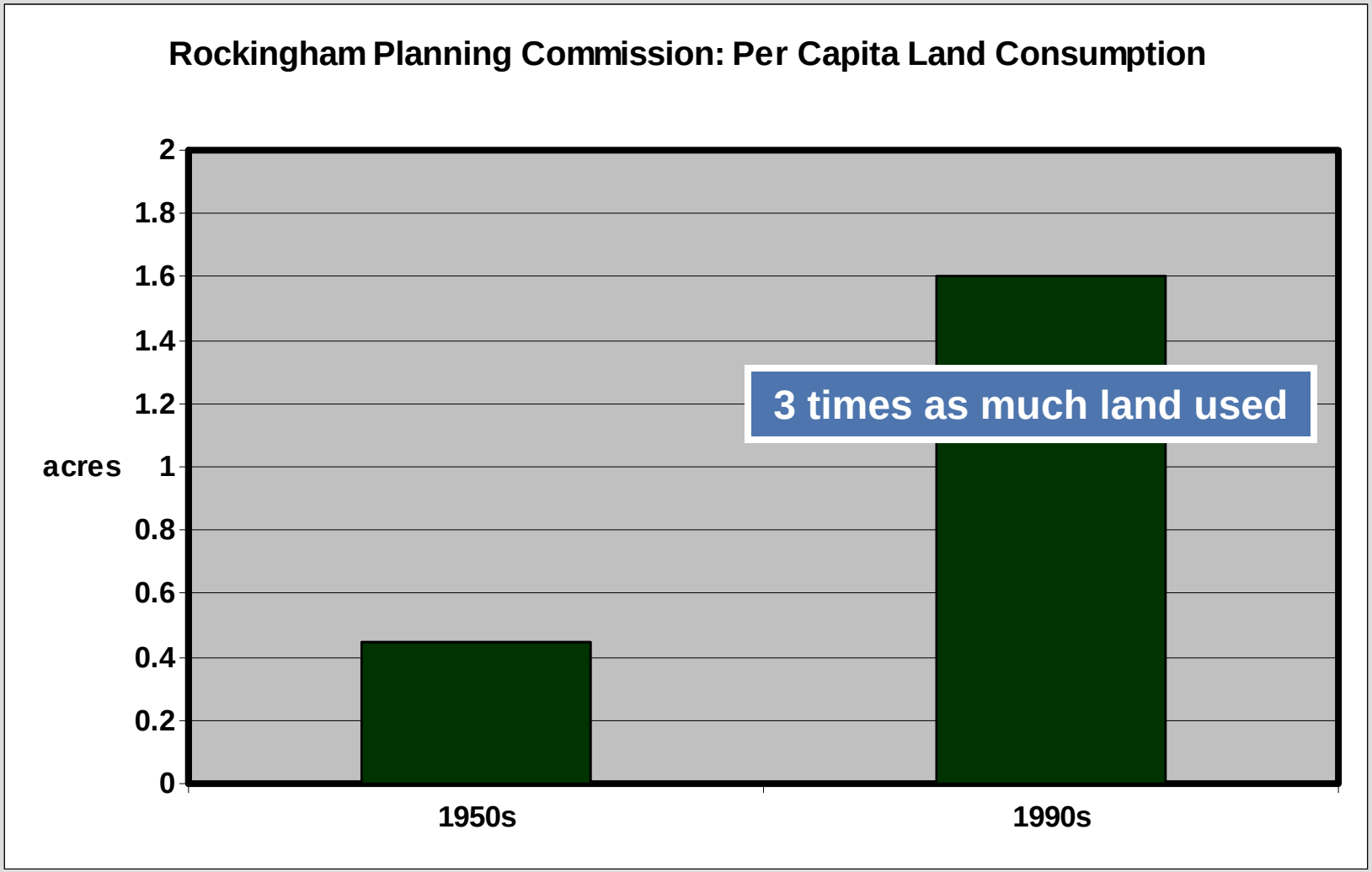
New Hampshire Land Use Trends



Source: The New Hampshire Office of Energy and Planning, "Achieving Smart Growth in New Hampshire"

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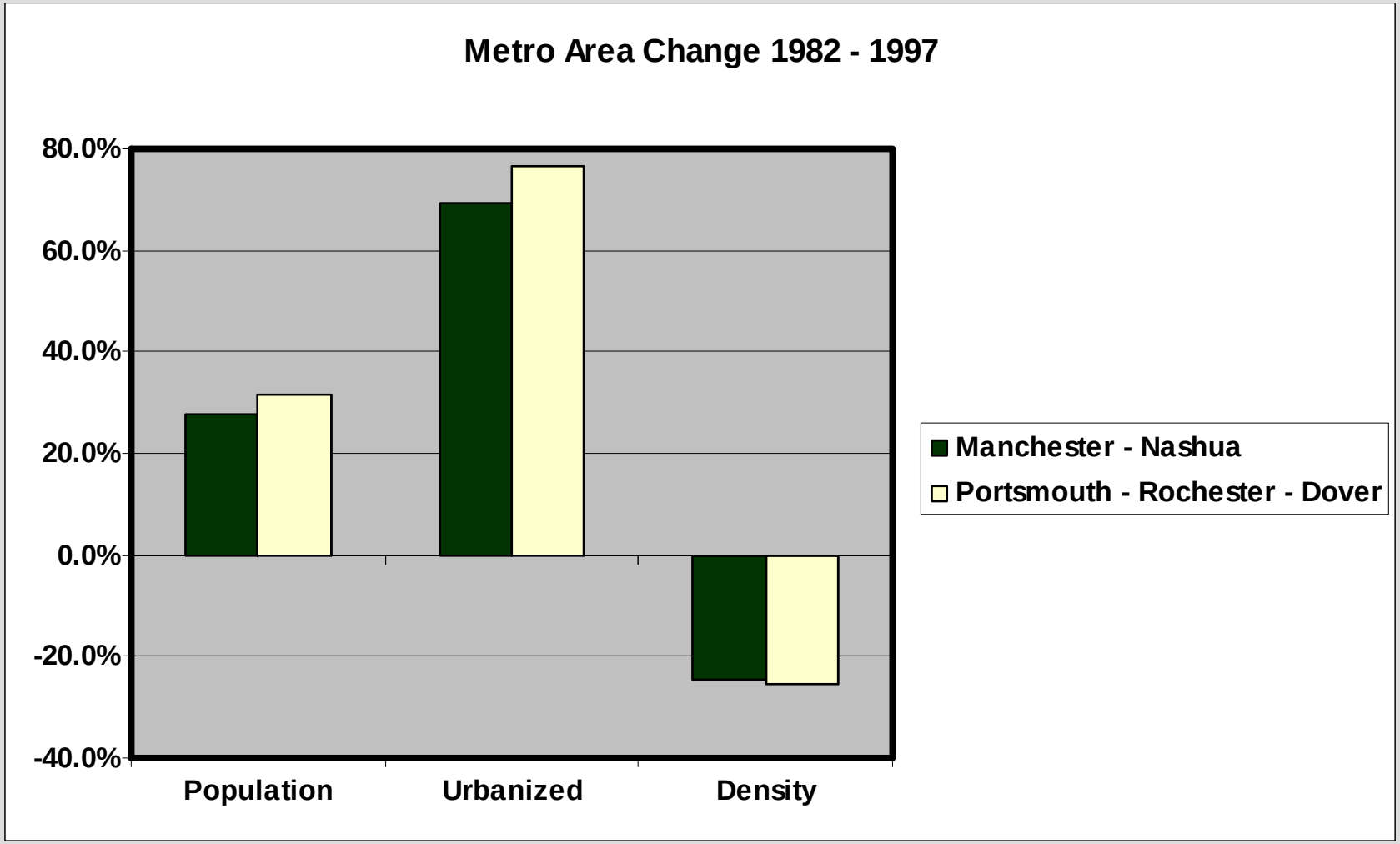
New Hampshire Land Use Trends



Source: The New Hampshire Office of Energy and Planning

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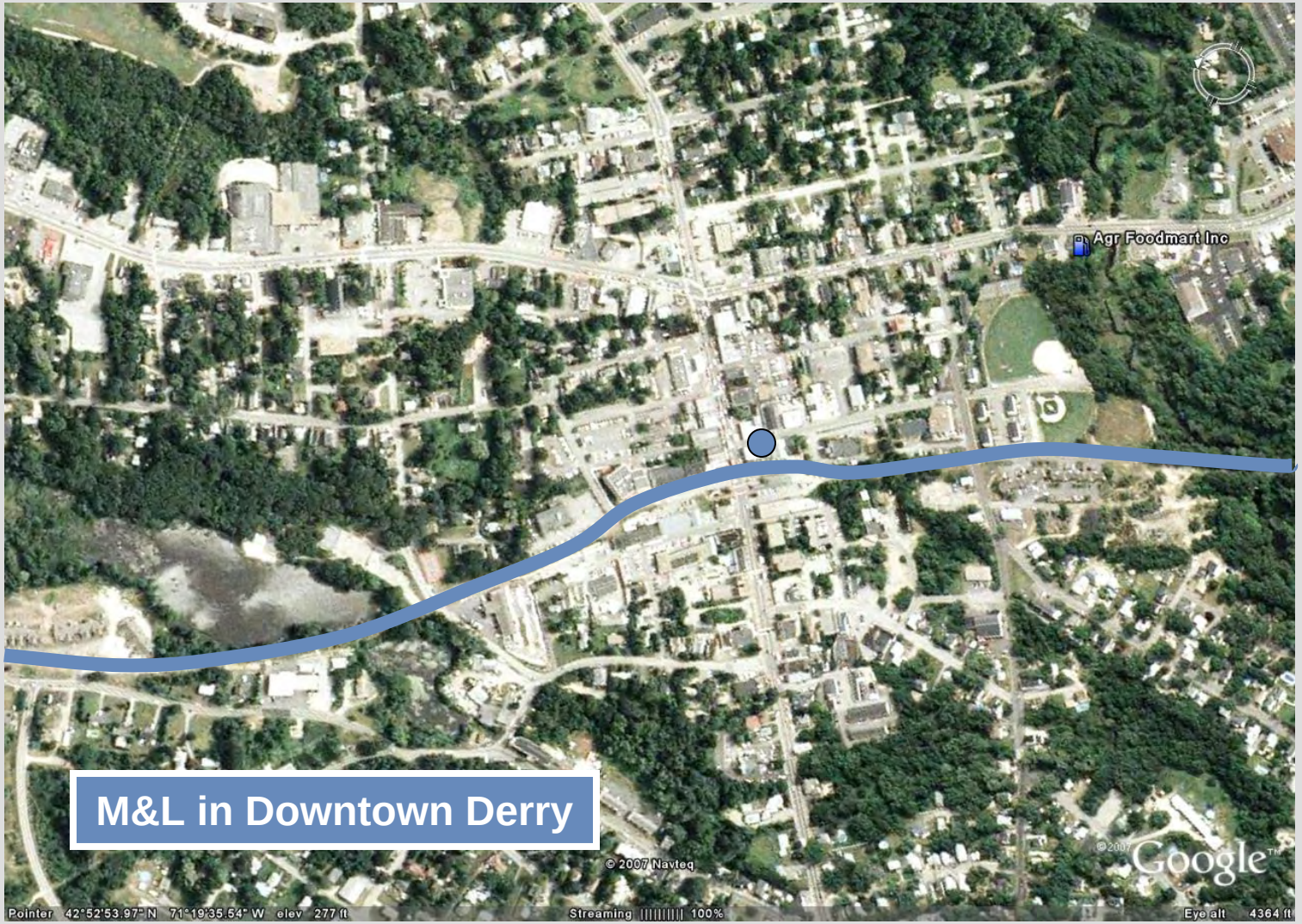
Derry, NH



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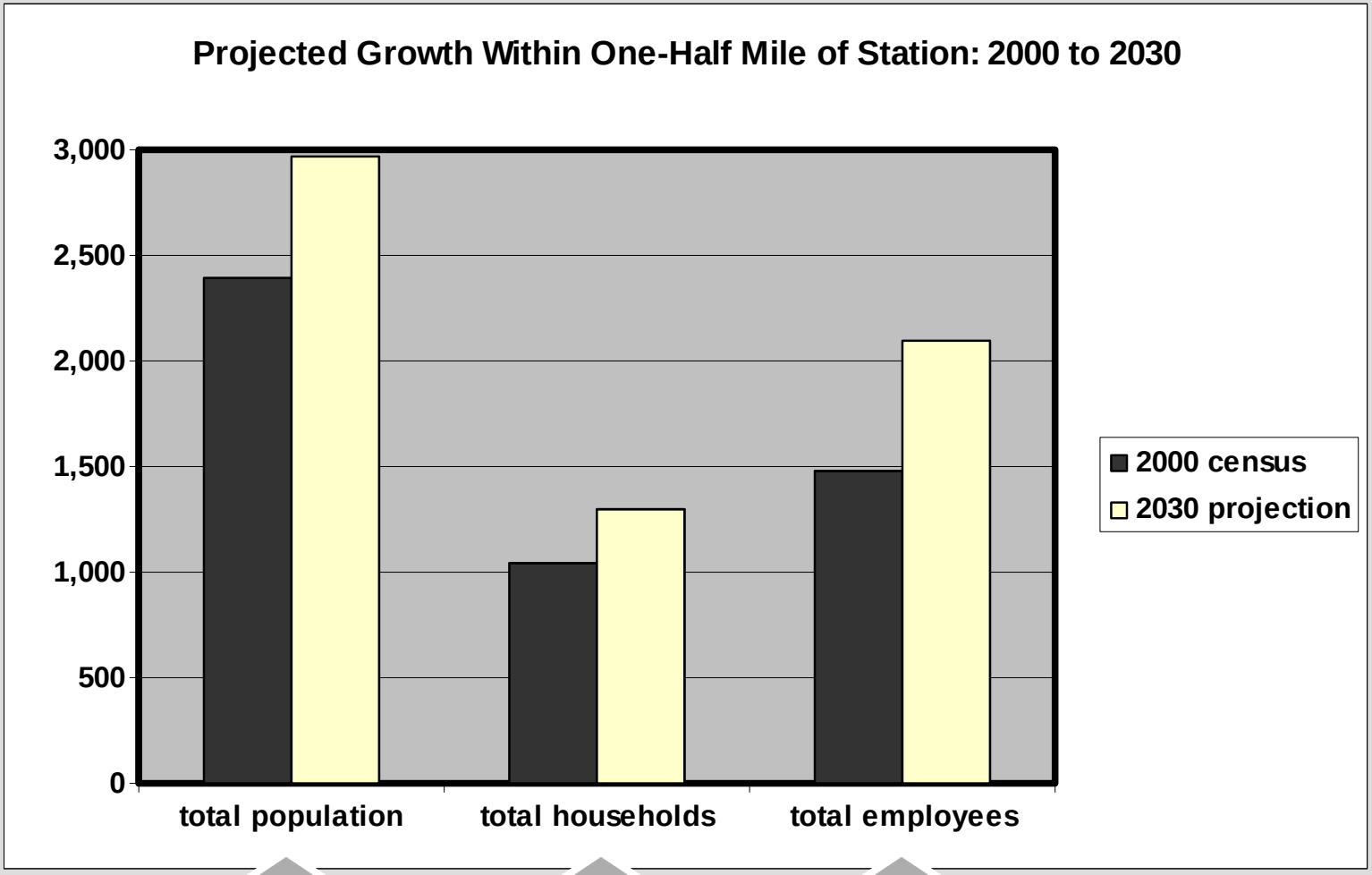
Derry, NH



+ 24%

+ 24%

+ 41%

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Derry, NH

Existing transit-supportive practices:

- New zoning code adopted in 2000: good mix of uses across districts
- Multifamily Residential district: density approaches transit-supportive level

Opportunities:

- Design regulatory and policy incentives to guide development
- Create a TOD overlay to allow increased density
- Implement parking suggestions in Master Plan

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Londonderry, NH

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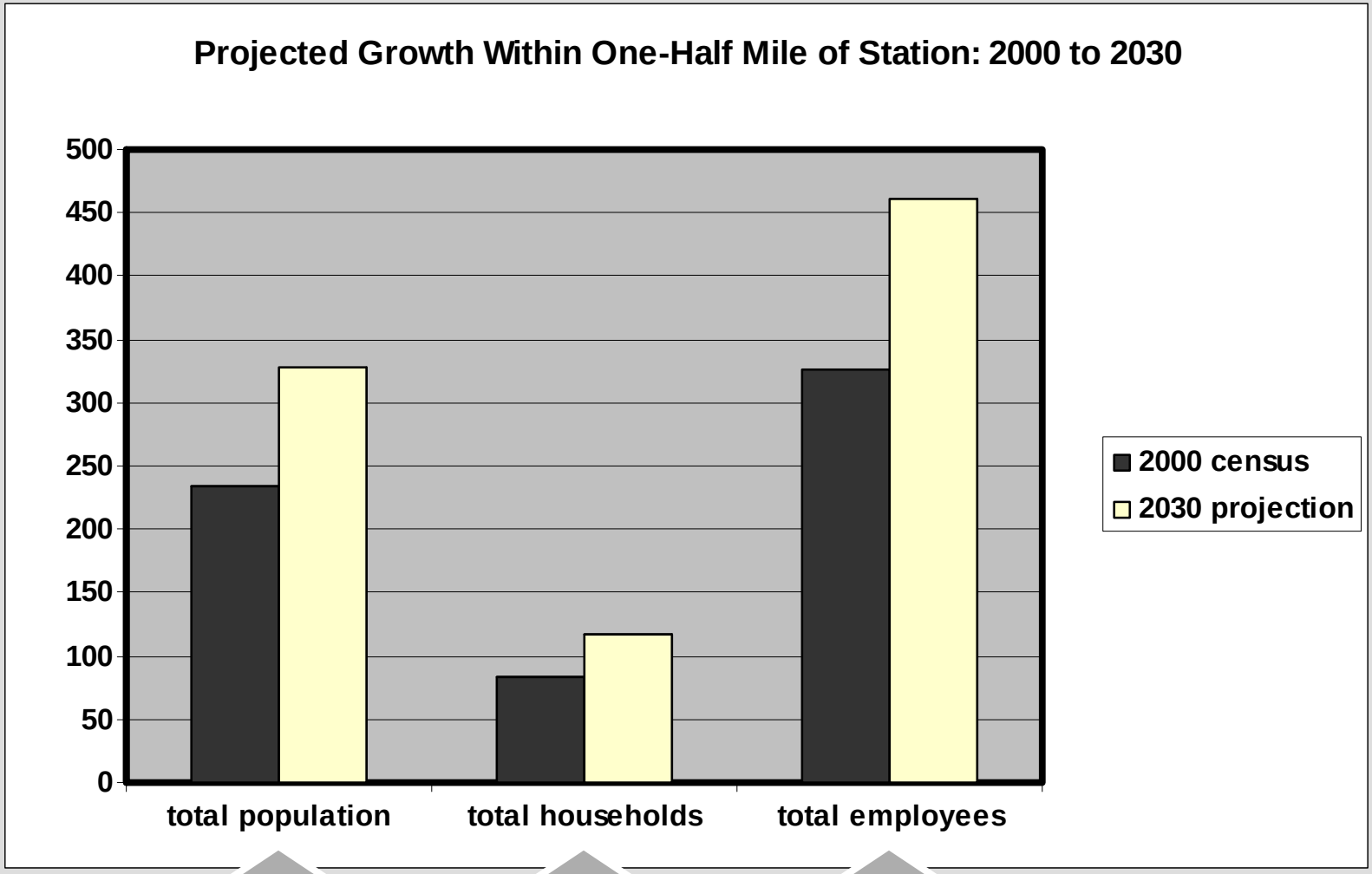
Londonderry, NH



+ 40%

+ 41%

+ 41%

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Londonderry, NH

Existing transit-supportive practices:

- Planned Overlay District: performance standards and incentives

Opportunities:

- Capitalize on existing infrastructure:
  - Target non-residential and multi-family growth to TOD overlay
  - Increase density near I-93 exits 4 and 5
- Expand incentive program outside of Planned Overlay District
- Implement design guidelines
- Affordable housing

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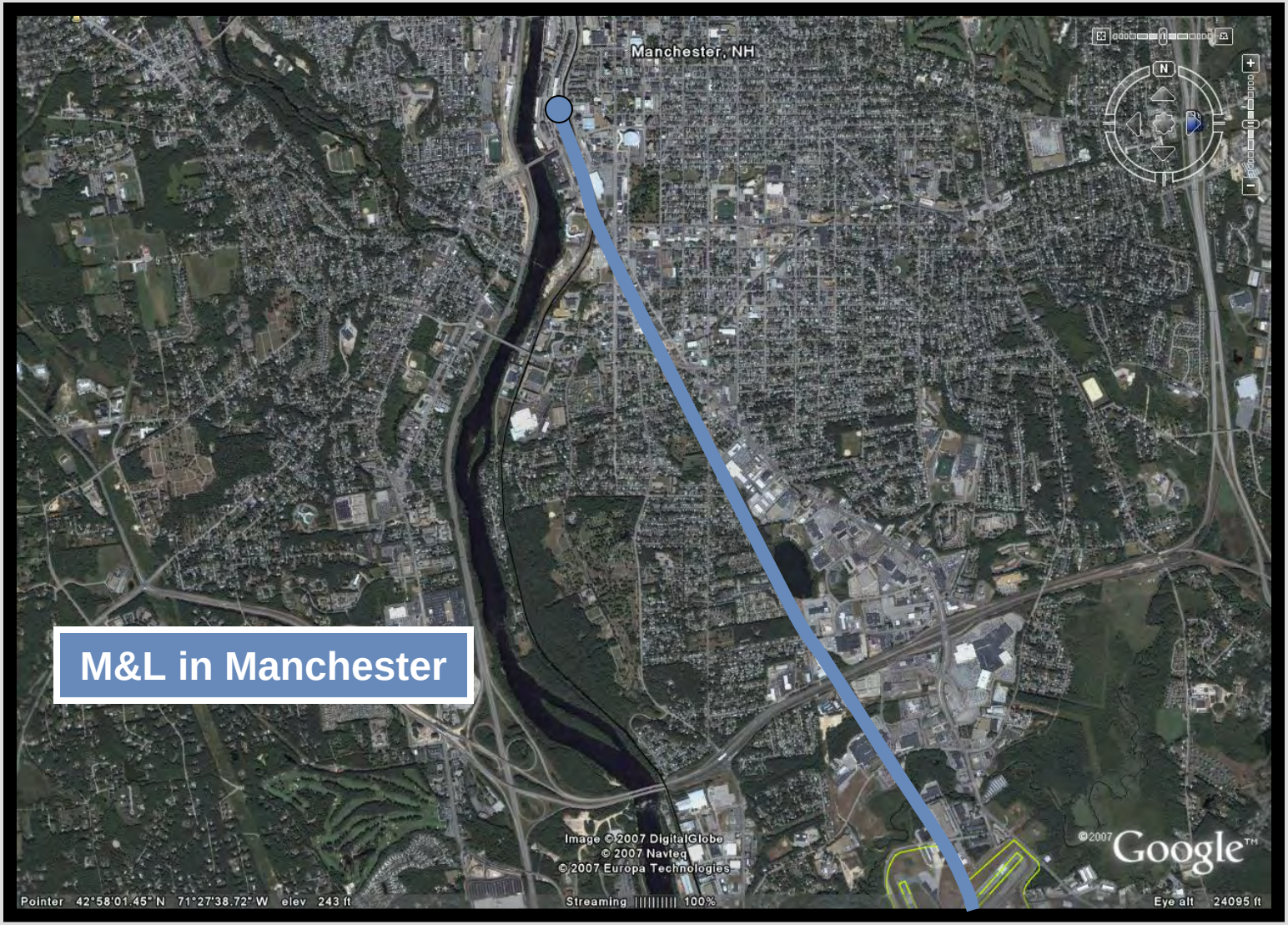
Manchester, NH



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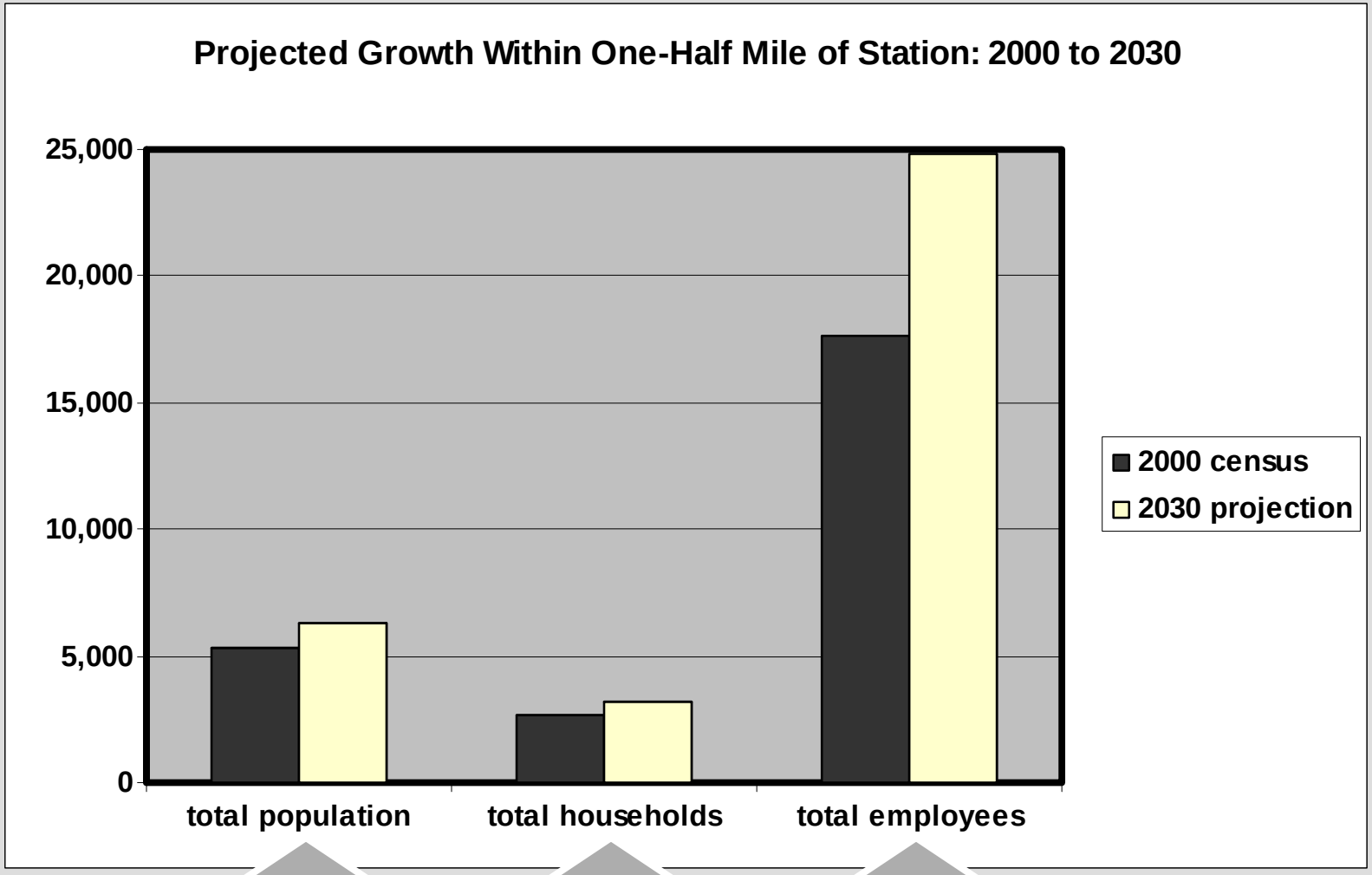
Manchester, NH



+ 17%

+ 17%

+ 41%

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Manchester, NH

Existing transit-supportive practices:

- Variety of base and overlay zoning districts: supports fine-grained development
- Zoning code creates framework for dense mix of uses

Opportunities:

- Implement parking suggestions of the Downtown Strategic Plan
- Expand design review process
- Infill development: City assembly and packaging of parcels

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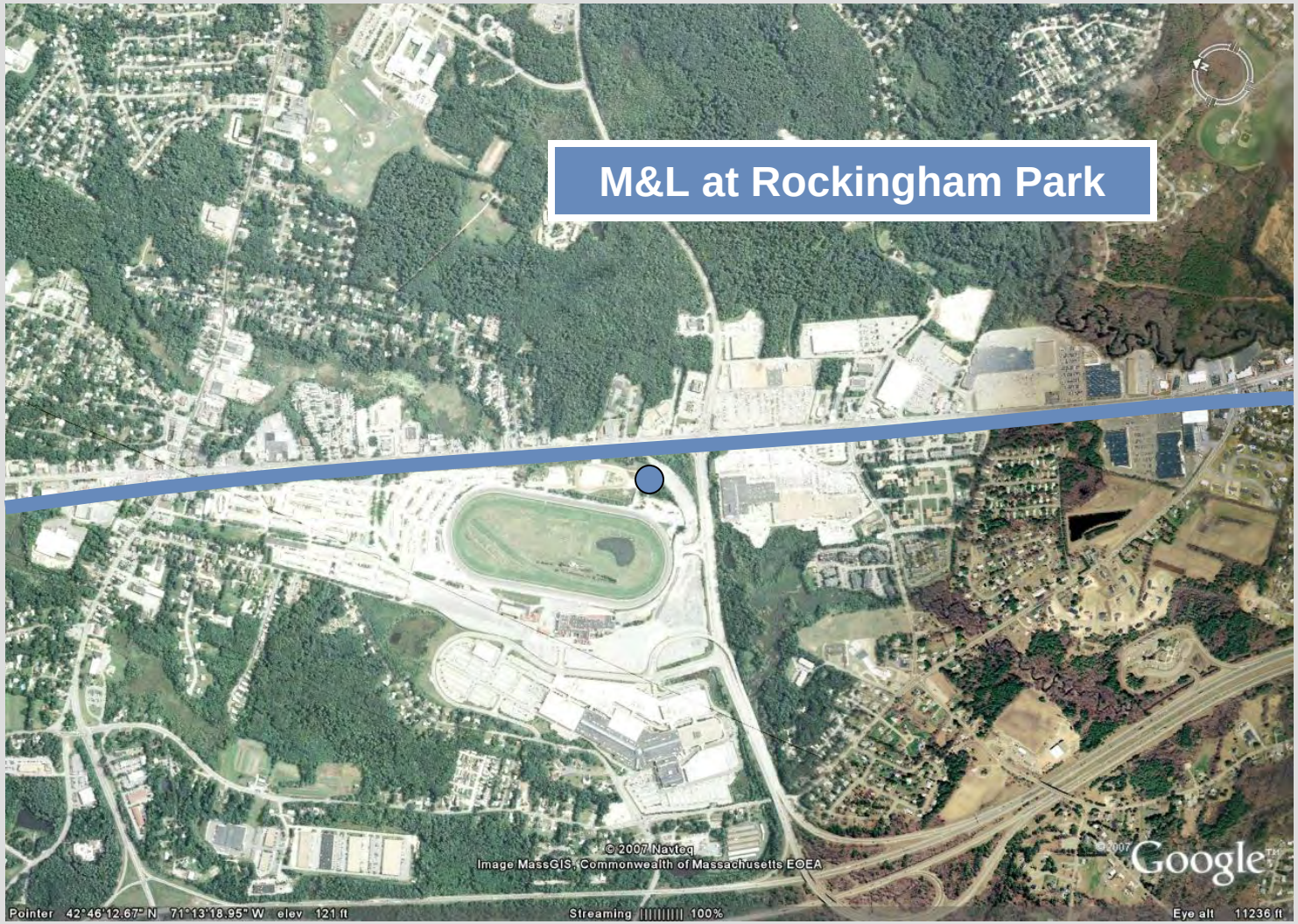
Salem, NH



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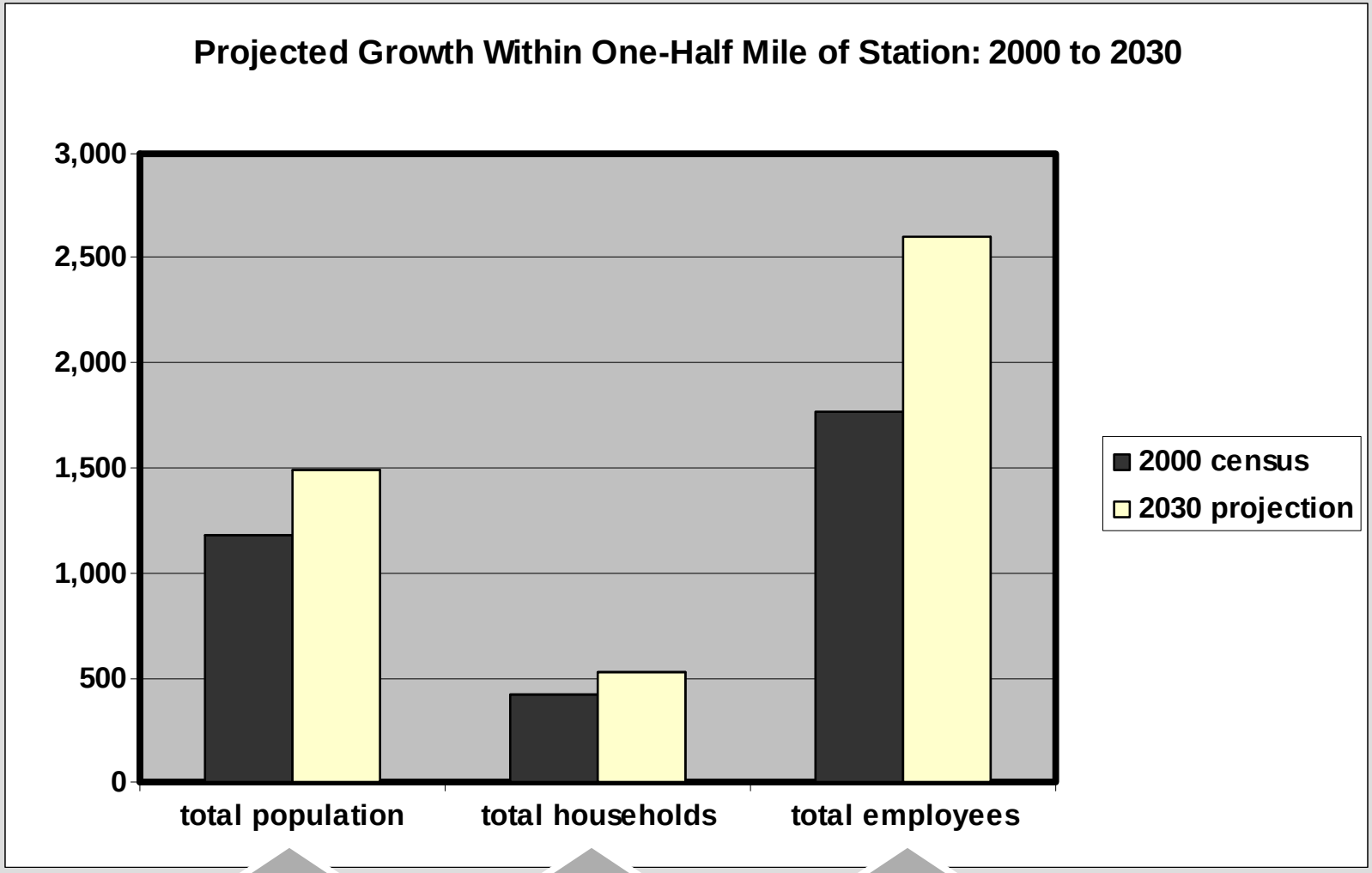
Salem, NH



+ 26%

+ 26%

+ 47%

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Salem, NH

Existing transit-supportive practices:

- Density bonus for open space preservation
- Density bonus for senior housing

Opportunities:

- Consider implementing a TOD district
- Reduce parking requirements to encourage pedestrians
- Expand design guidelines beyond Town Center district
- Clarify affordable housing bonus

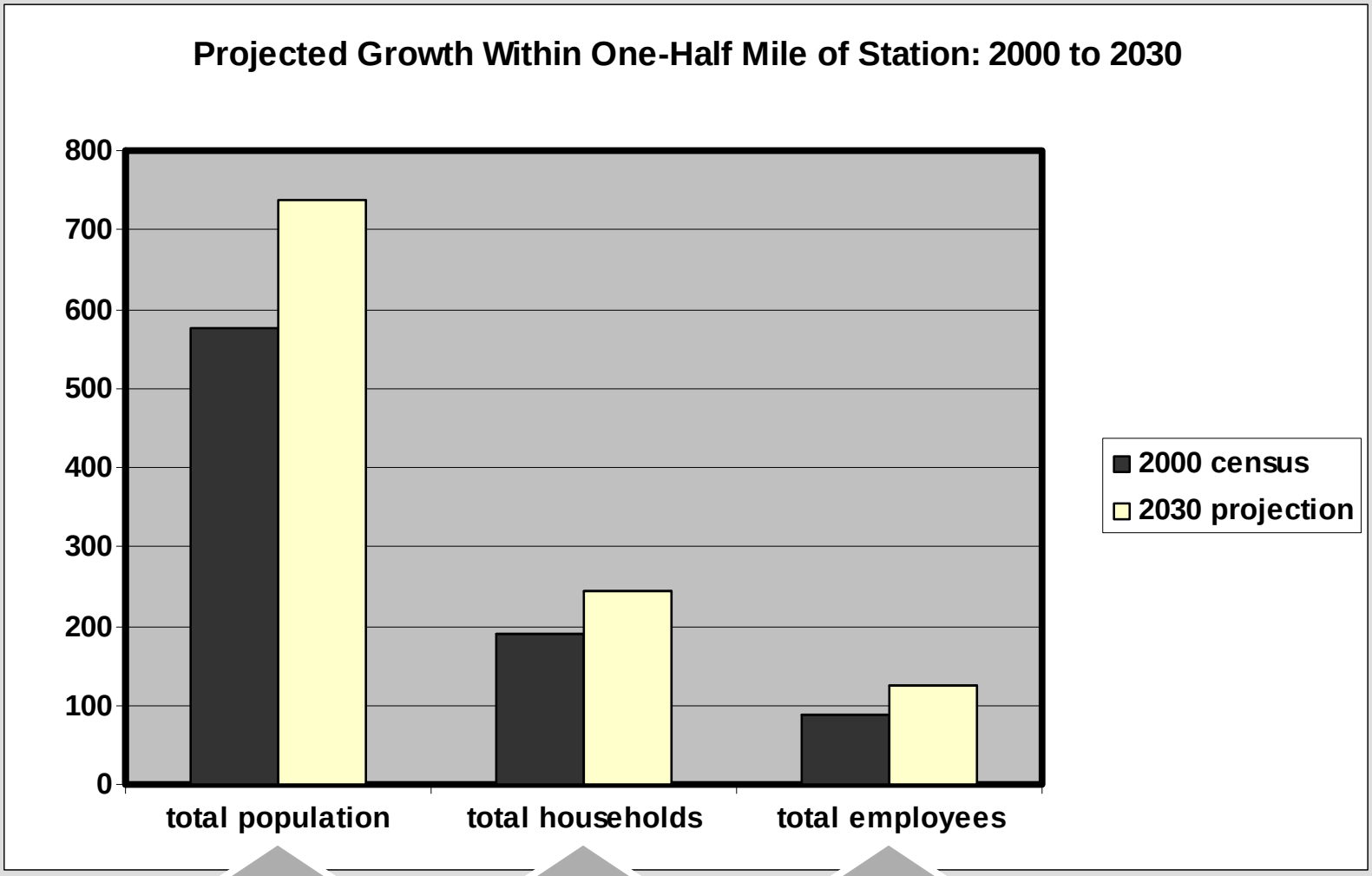
HNTB

Windham, NH

N

HNTB

Windham, NH



+ 28%

+ 28%

+ 41%

HNTB

Windham, NH

Existing transit-supportive practices:

- Three existing districts allow for denser mix of uses
- Density bonus for elderly housing
- Shared parking allowed in multiple districts

Opportunities:

- Consider implementing a TOD district
- Reduce minimum lot sizes to increase housing diversity and preserve open space

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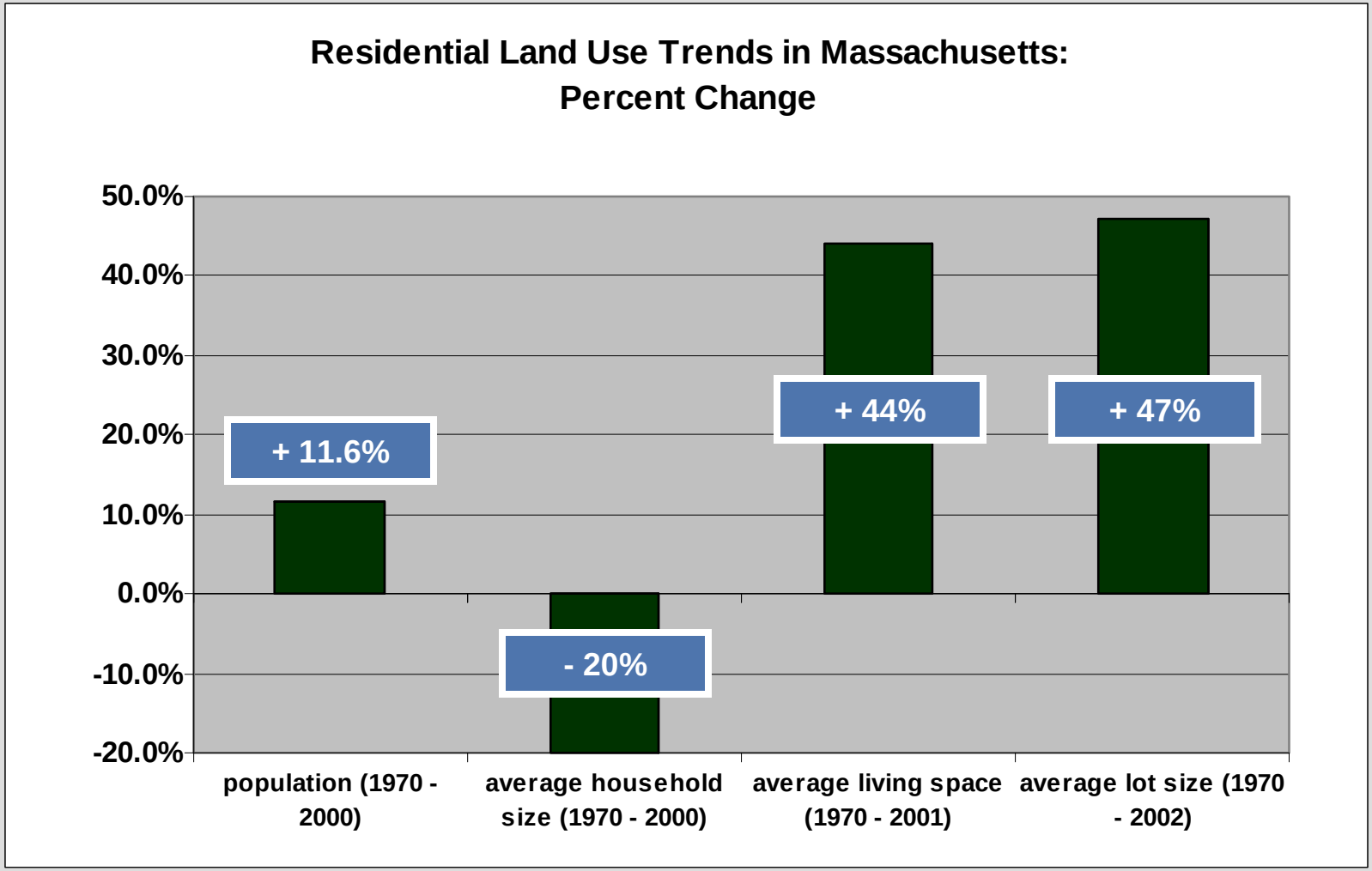
Massachusetts Land Use Trends



Source: United States Census Bureau; Massachusetts Audubon Society, "Losing Ground: At What Cost?"(2003)

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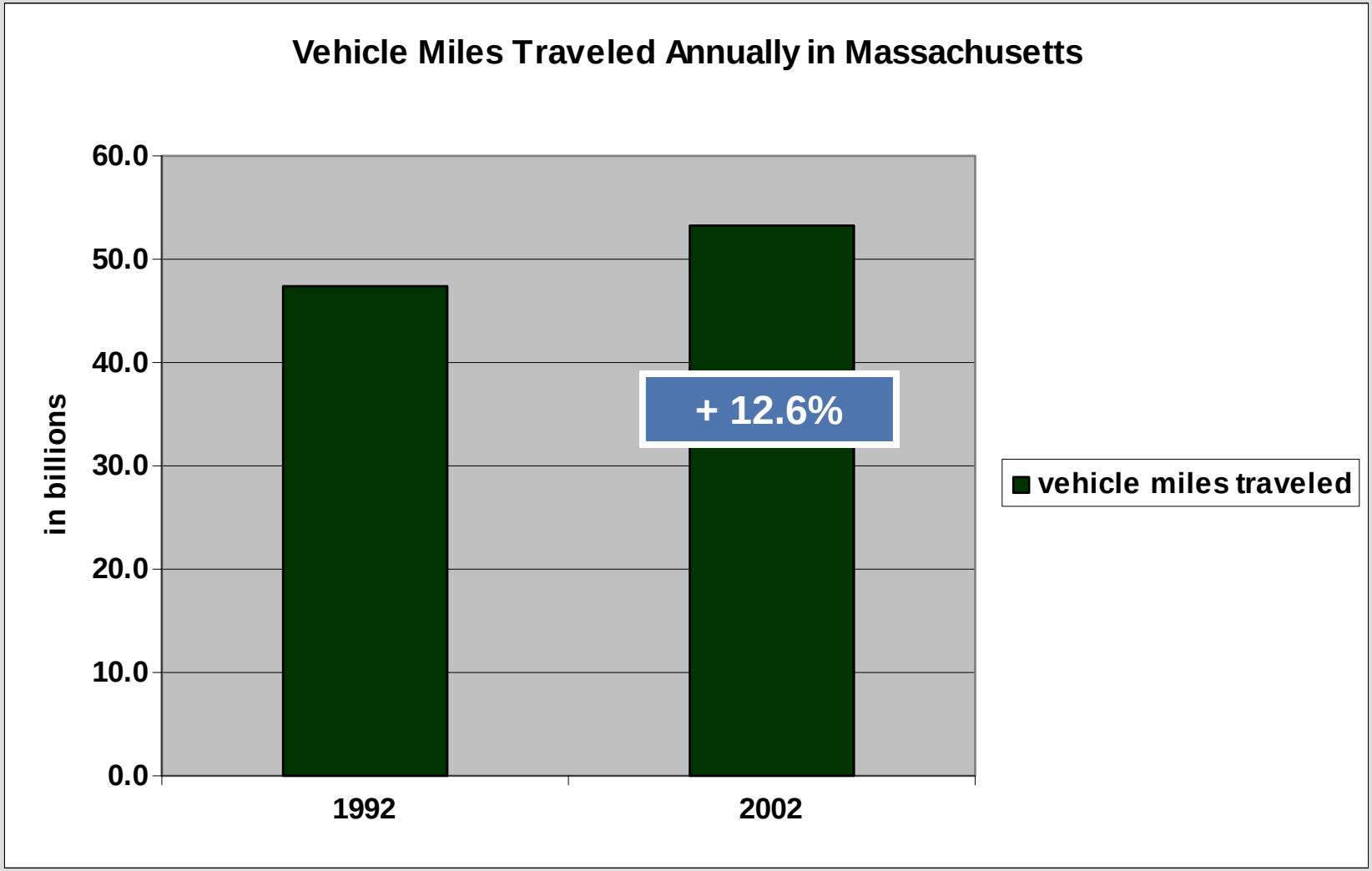
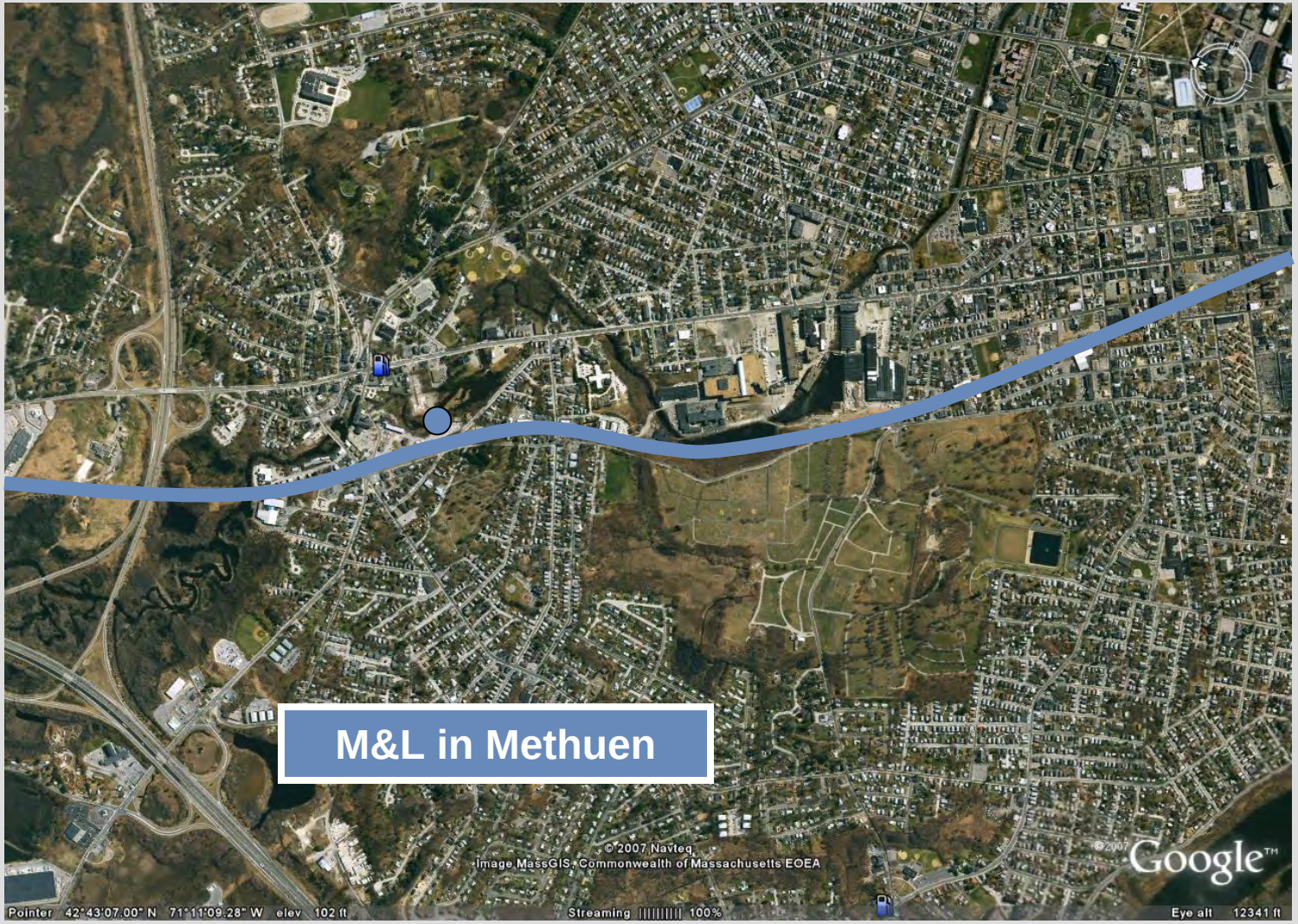
Massachusetts Land Use Trends



Source: Massachusetts Executive Office of Transportation and Construction, "Massachusetts Transportation Facts 2004"

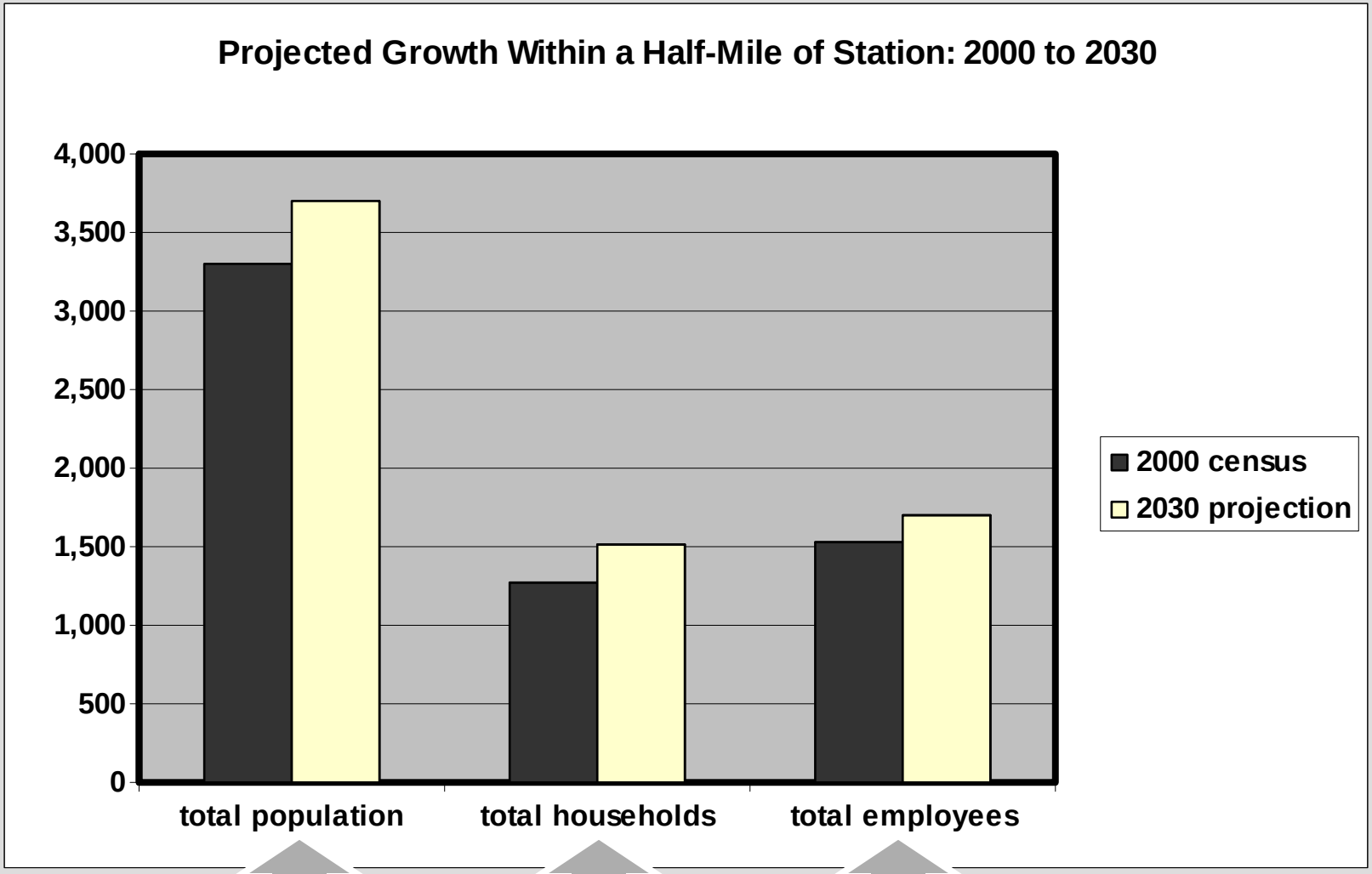
Methuen, MA



N

HNTB

Methuen, MA



+ 12%

+ 19%

+ 10%

HNTB

Methuen, MA

Existing transit-supportive practices:

- Affordable housing density bonus
- Parking requirement reductions available

Opportunities:

- Infill development: assembly and packaging of City-owned parcels
- Consider implementing a TOD district
- Respond to Master Plan:
  - Allow mixed uses to balance economic development
  - Increase allowed density to concentrate development

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Land Use Analysis:
Summary Findings

- Low density patterns
- Separation of uses
- Auto-centric development
- Uniform housing stock
- Decreasing affordability levels

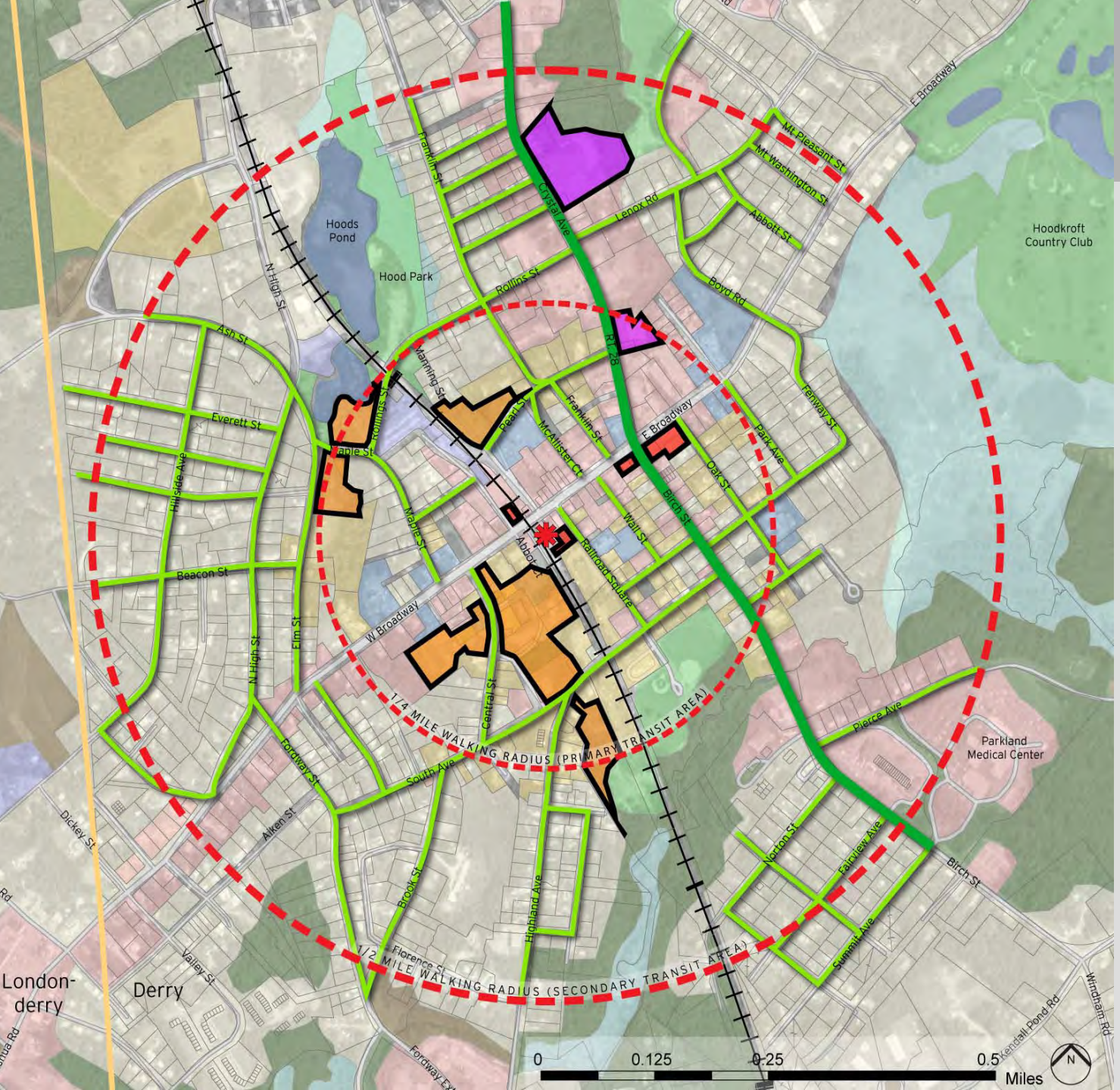
HNTB

Land Use Analysis:
Summary Findings

- Connection of sprawl and density
- Goals ➡ Policies ➡ Actions
- Coordinate transportation and land use

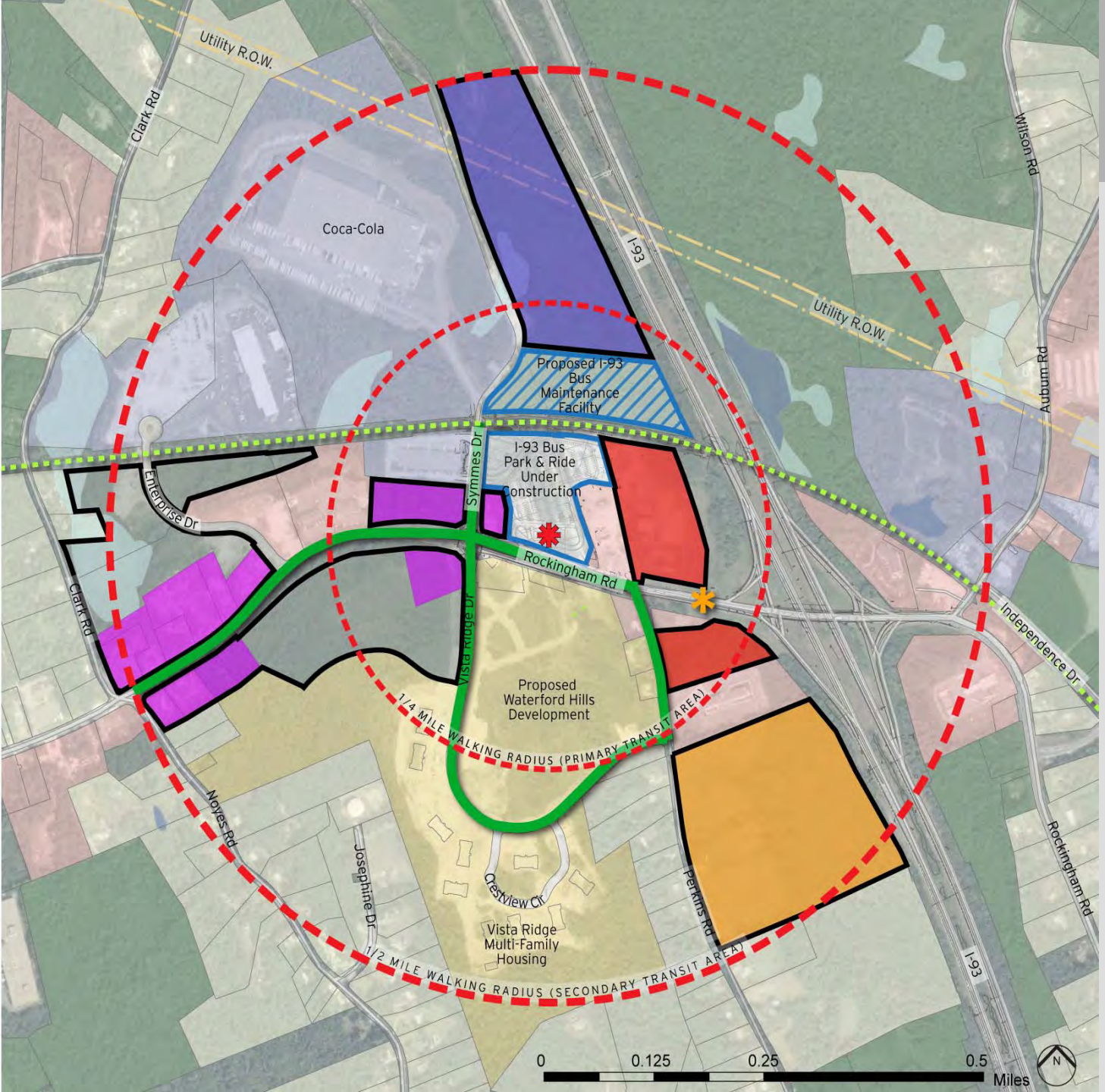
HNTB

Derry


Hoods Pond
Hood Park
Hoodkroft Country Club
Parkland Medical Center
Franklin St
Crystal Ave
Lenox Rd
Mt Pleasant St
Mt Washington St
Abbott St
Boyd Rd
F Broadway
Rollins St
N High St
Ash St
Everett St
Hillside Ave
Maple St
Manning St
Pearl St
McAllister Ct
Fenway St
Park Ave
Oak St
Birch St
Wall St
Railroad Square
Abbott St
Beacon St
W Broadway
Elm St
Central St
Pierce Ave
Fordway St
South Ave
Alken St
Dickey St
Brook St
Highland Ave
Norton St
Fairview Ave
Summit Ave
Valley St
Florence St
Kendall Pond Rd
Windham Rd
Fordway Ext
London-derry
Derry
1/4 MILE WALKING RADIUS (PRIMARY TRANSIT AREA)
1/2 MILE WALKING RADIUS (SECONDARY TRANSIT AREA)
0
0.125
0.25
0.5
Miles
N

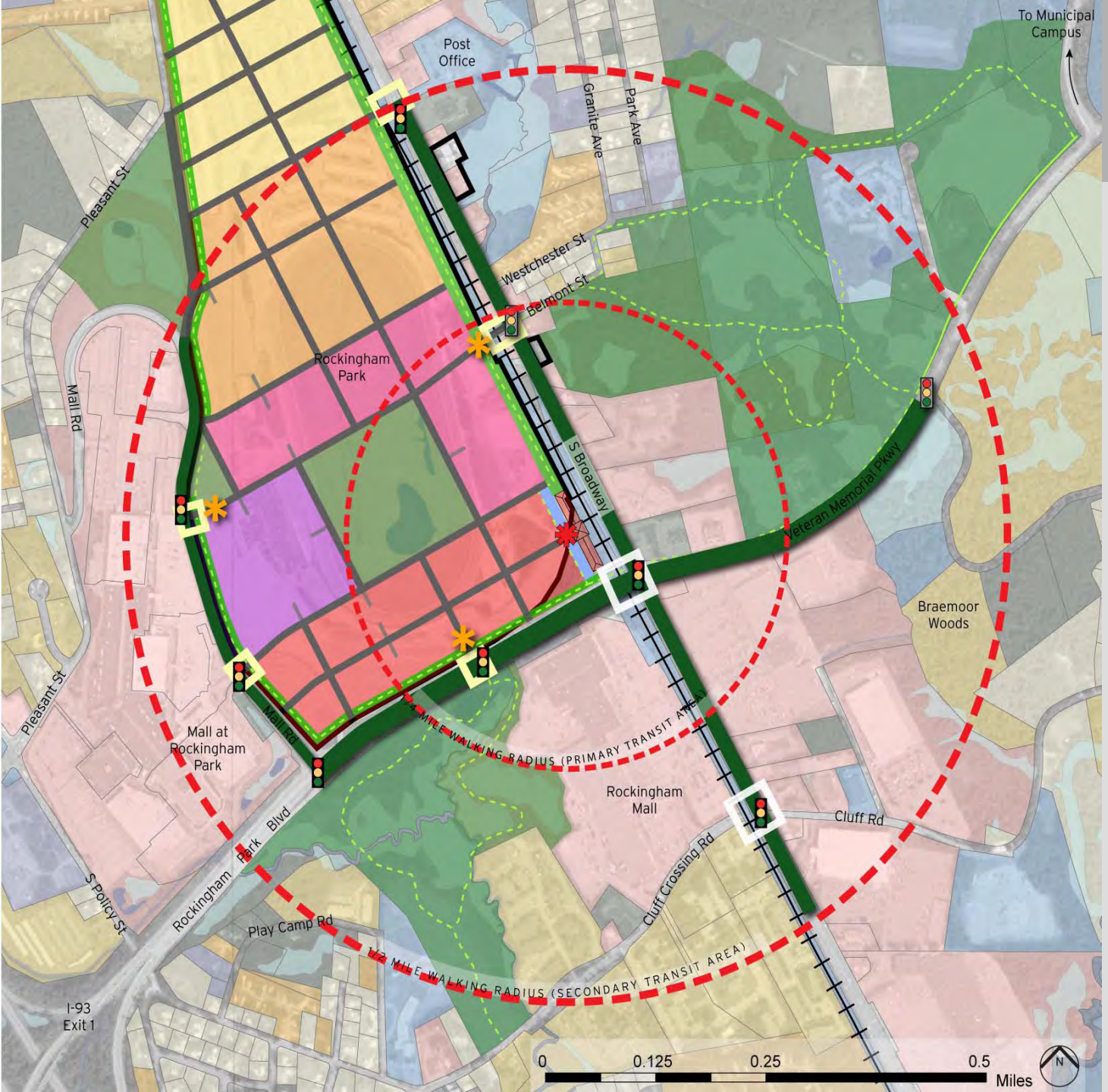
HNTB

Exit 5


Utility R.O.W.
Clark Rd
Coca-Cola
I-93
Wilson Rd
Utility R.O.W.
Auburn Rd
Proposed I-93 Bus Maintenance Facility
I-93 Bus Park & Ride Under Construction
Symmes Dr
Enterprise Dr
Rockingham Rd
Clark Rd
Vista Ridge Dr
Independence Dr
Proposed Waterford Hills Development
1/4 MILE WALKING RADIUS (PRIMARY TRANSIT AREA)
Noyes Rd
Josephine Dr
Crestview Cir
Perkins Rd
Rockingham Rd
Vista Ridge Multi-Family Housing
1/2 MILE WALKING RADIUS (SECONDARY TRANSIT AREA)
I-93
0
0.125
0.25
0.5
Miles
N

HNTB

Salem


To Municipal Campus
Post Office
Granite Ave
Park Ave
Pleasant St
Westchester St
Belmont St
Rockingham Park
Mall Rd
S Broadway
Veteran Memorial Pkwy
Braemoor Woods
Pleasant St
Mall at Rockingham Park
Mall Rd
1/4 MILE WALKING RADIUS (PRIMARY TRANSIT AREA)
Rockingham Mall
Cluff Rd
Cluff Crossing Rd
Rockingham Park Blvd
S Policy St
Play Camp Rd
1/2 MILE WALKING RADIUS (SECONDARY TRANSIT AREA)
I-93 Exit 1
0
0.125
0.25
0.5
Miles
N

HNTB