

Transit-Oriented Development: Performance-based design

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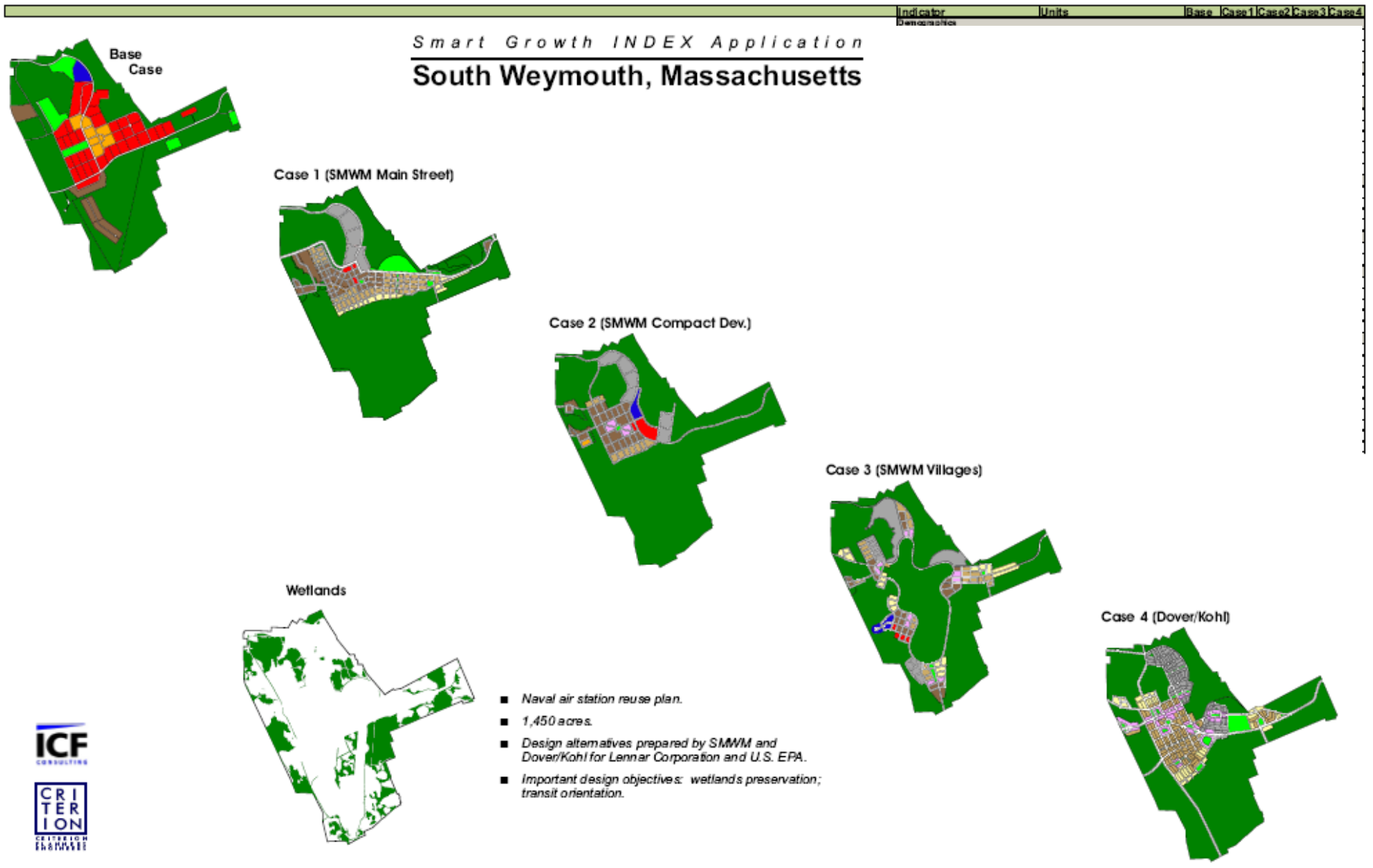
DATA

September 28, 2005

Case study: South Weymouth Naval Air Station



SWNAS: Designing for TOD



Use Indicators to evaluate scenarios

DEMOGRAPHICS

- Population
- Employment

LAND-USE

- Block Size
- Centeredness
- Development Footprint
- Fiscal Impact
- Parcel Size
- Use Mix
- Use Balance

HOUSING

- Amenities Proximity
- Employment Proximity
- Energy Consumption
- Housing Affordability
- Dwelling Unit Density
- Dwelling Type Share
- Transit Proximity
- Water Consumption

EMPLOYMENT

- Commercial Building Density
- Employment Density
- Jobs to Housing Balance
- Transit Proximity

RECREATION

- Park Proximity to Housing
- Park Space Supply

ENVIRONMENT

- Air Pollutant Emissions
- Greenhouse Gas Emissions
- Imperviousness
- Nonpoint Source Pollution
- Open Space Connectivity
- Open Space Share
- Stormwater Runoff

TRAVEL

- Bicycle Network Coverage
- Dwellings With Multi-Modal Access
- External Street Connectivity
- Internal Street Connectivity
- Parking Demand/Supply
- Parking Lot Size
- Pedestrian Accessibilities
- Pedestrian Crossing Distance
- Pedestrian Intersection Safety
- Pedestrian Network Coverage
- Pedestrian Route Directness
- Pedestrian Setback
- Rail Transit Boardings
- Street Network Density
- Street Network Extent
- Street Segment Length
- Transit Service Coverage
- Transit Service Density
- Vehicle Miles Traveled
- Vehicle Trips

Using Indicator mapping to understand plan performance



**Housing Proximity to
Amenity (grocery)**



**Housing Proximity to
Transit Stops**

Using use indicators to improve plans

		Design Scenarios													
Indicator	Units	Mills		Post Mills		Main Street		Compact		Villages		Dover Kohl		Preferred	
Population	residents	1,540		1,540		10,211		9,468		8,924		6,955		5,959	
Employment	employees	7,078		7,214		4,372		4,825		4,988		2,137		2,438	
Population Density	res/gross ac	41.62		21.42		50.73		79.84		60.59		41.27		56.09	
Use Mix	0-1 scale	0.04		0.03		0.14		0.15		0.15		0.27		0.14	
Use Balance	0-1 scale	0.51		0.71		0.70		0.80		0.81		0.91		0.76	
Single-Family Dwelling Density	DU/net ac	--		--		7.78		--		9.13		4.57		7.72	
Multi-Family Dwelling Density	DU/net ac	18.92		9.74		27.54		36.32		33.67		22.86		38.28	
Single-Family Dwelling Share	% total	0.0		0.0		8.7		0.0		9.4		6.0		10.1	
Multi-Family Dwelling Share	% total	100.0		100.0		91.3		100.0		90.6		94.0		88.1	
Amenities Proximity	avg walk ft	1,732		5,021		2,083		1,244		1,081		655		1,266	
Transit Proximity to Housing	feet	5,298		5,702		910		884		849		743		452	
Jobs to Housing Balance	jobs/DU	10.11		10.31		0.96		1.12		1.26		0.69		0.78	
Employment Density	emps/net ac	24.12		24.46		55.40		45.78		40.85		19.77		87.54	
Commercial Building Density	commercial floor area per net acre	0.28		0.28		0.43		0.45		0.32		0.33		1.00	
Transit Proximity to Employment	feet	8,171		5,579		758		781		1,339		768		584	
Park Space Supply	ac/1000 pers	114.9		45.0		4.3		6.5		0.6		6.1		16.1	
Park Proximity	avg walk ft	8,173		4,382		1,239		991		2,121		677		610	
Open Space Share	% total area	53.5		64.7		69.9		75.4		74.2		71.1		68.5	
Open Space Connectivity	0-1 scale	0.90		0.93		0.95		0.96		0.94		0.95		0.94	
Stormwater Runoff	cubic ft per acre per year	27,713		30,937		20,204		16,984		20,385		22,262		21,083	
Nonpoint Pollution	kilograms per acre per year	50.9		54.5		36.8		30.7		38.1		42.3		38.9	
Imperviousness	%	28.49		35.40		17.30		16.12		17.62		18.63		16.21	
Internal Street Connectivity	ratio	0.43		0.71		0.97		0.95		0.96		0.97		0.94	
External Street Connectivity	feet	9,047		11,309		5,654		9,047		5,654		4,523		5,654	
Street Segment Length	ft	3,619		854		378		544		431		408		229	
Street Centerline Distance	total ft	32,301		64,317		93,428		69,035		98,719		117,111		124,692	
Street Network Density	st mi/sq mi	2.7		5.4		7.9		5.8		8.3		9.9		10.5	
Pedestrian Network Coverage	% of streets	100.0		100.0		100.0		100.0		100.0		100.0		100.0	
Pedestrian Crossing Distance	feet	68		47		41		45		41		40		34	
Street Route Directness	walk/air ratio	1.71		1.43		1.50		1.44		1.52		1.24		1.28	
Pedestrian Accessibilities	% w/i 15 min	91.5		99.2		98.9		99.9		97.3		100.0		93.6	
Home Based Vehicle Miles Traveled	mi/day/capita	19.9		20.0		18.6		18.5		18.4		19.7		19.6	

Best practice ratings

Favorable

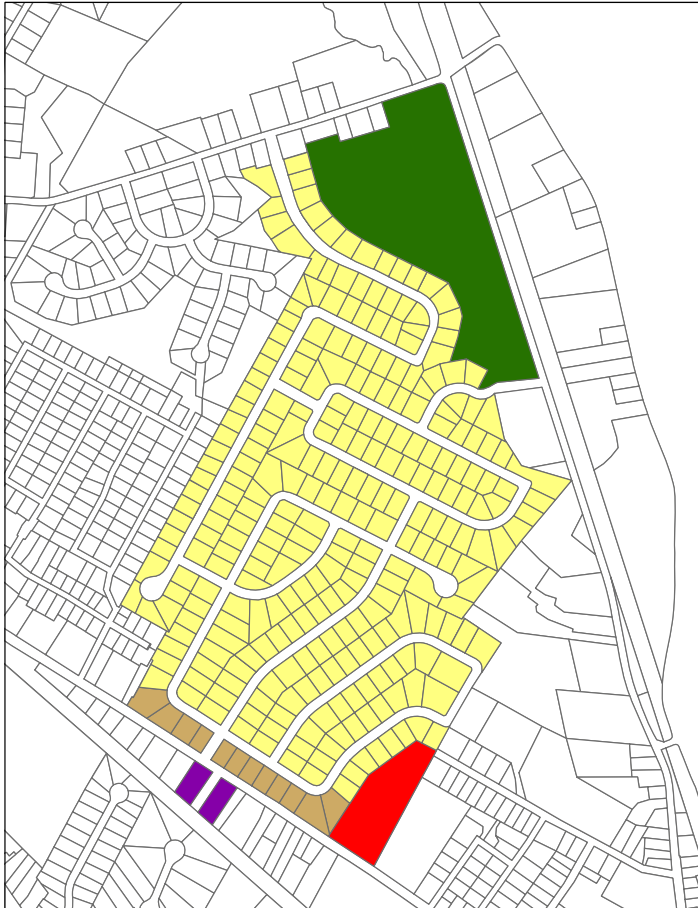
Fair

Unfavorable

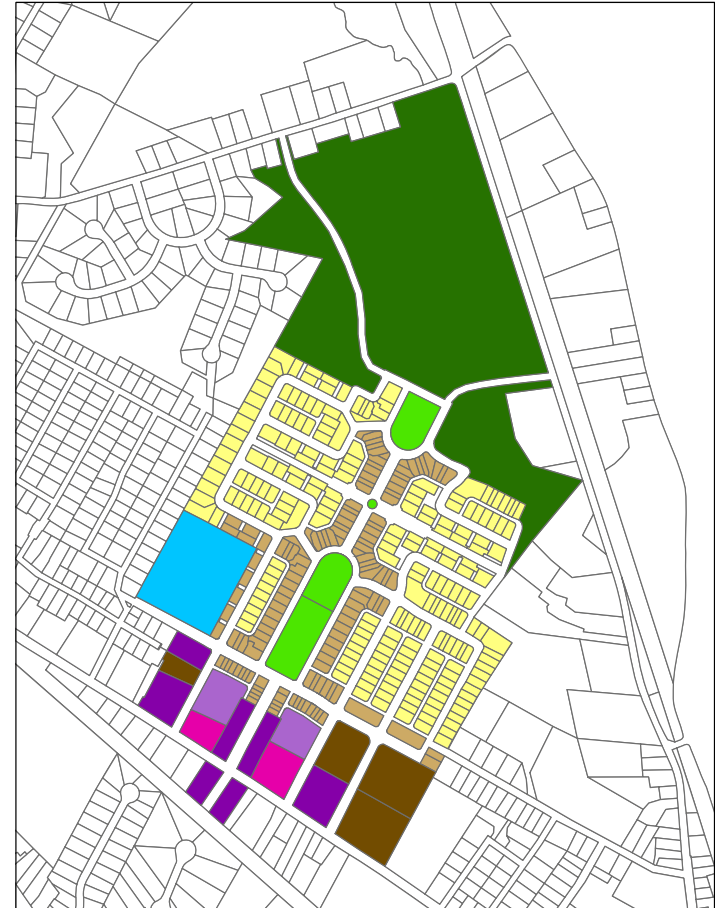
6	7	16	16	14	15	20
5	3	5	4	6	6	3
14	15	5	5	6	5	3

Use TOD to help fix existing places

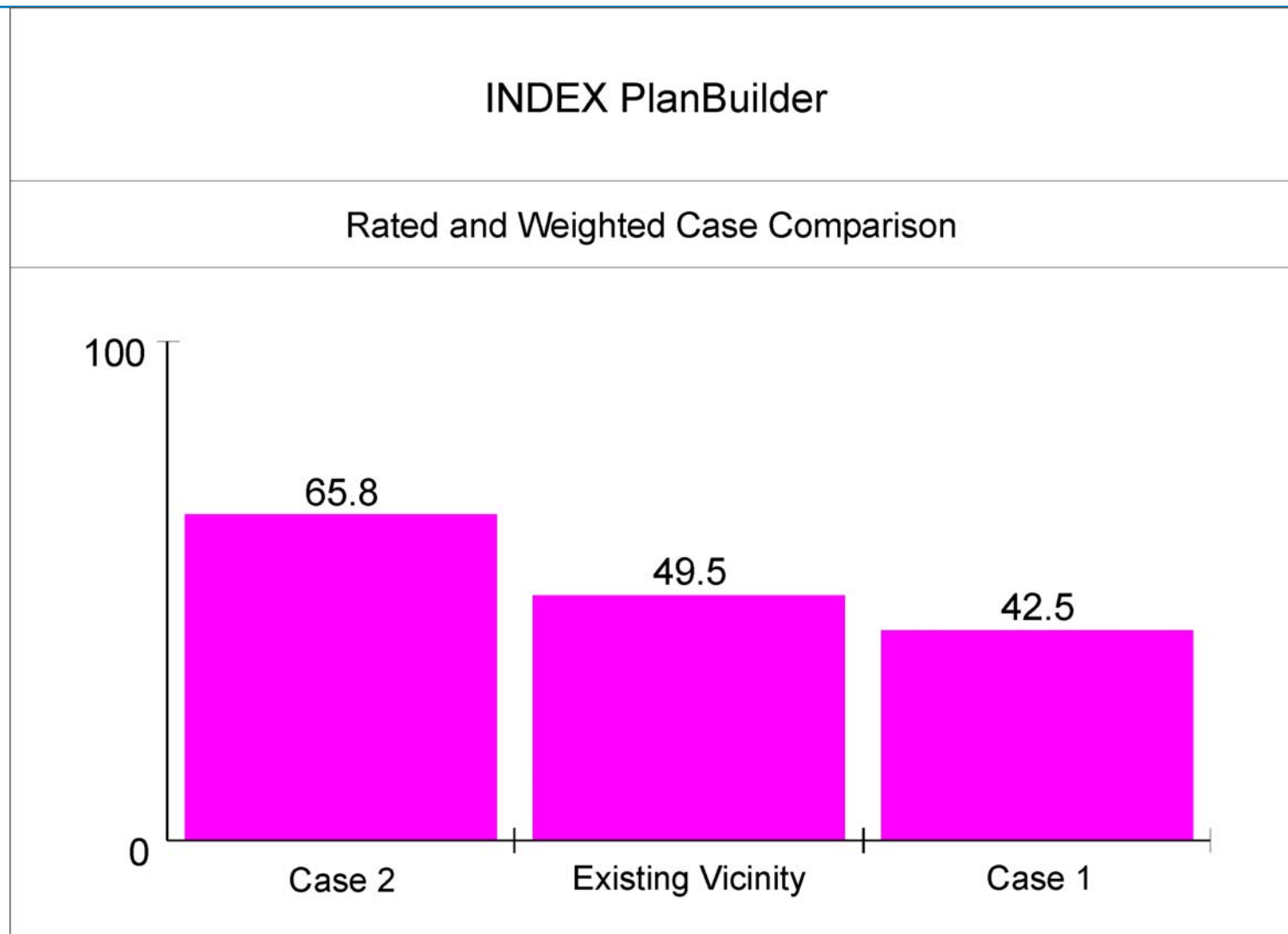
Case 1



Case 2



Alternative Plan Ranking

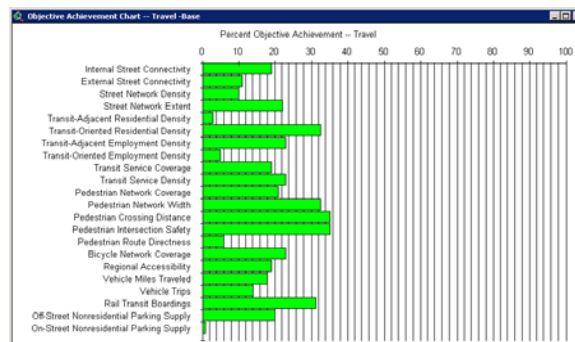


Use performance measurement to monitor adopted plan build-out

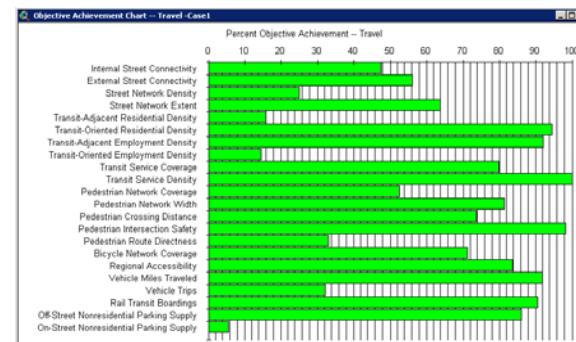
Phase 1



Phase 2



Incremental Goal Achievement



Cumulative Goal Achievement

Who should decide?

You should.

