City of Nashua
Paving Program
Street Selection

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May 11, 2011

Street Network

- Total 304 miles of streets
- Major streets – arterial, collectors, commercial
  = 62 miles
- Residential = 242 miles

Yearly Paving Needs

• Total Road Mileage in Nashua	304 Miles	
• Miles of Major Roads	62 Miles	20%
• Frequency of Paving	7-10 Years	
• Total Need	7.3 Miles per Year	2.4%
• Miles of Residential Roads	242 Miles	80%
• Frequency of Paving	15-20 Years	
• Total Need	13.4 Miles per Year	4.4%
• Total Major and Resid Need	20.7 Miles per Year	6.8%

Pavement Condition Survey

- DPW surveys pavement older than 5 yrs every 2 yrs
- Longer streets divided into segments
  - 1500 segments total in network
- Deteriorations observed and estimated
  - types, severity, percent area
- Form filled out

Photos of Deterioration Types

Alligator Cracking

Pothole

Photos of Deterioration Types

Rutting

Longitudinal and Transverse Cracks

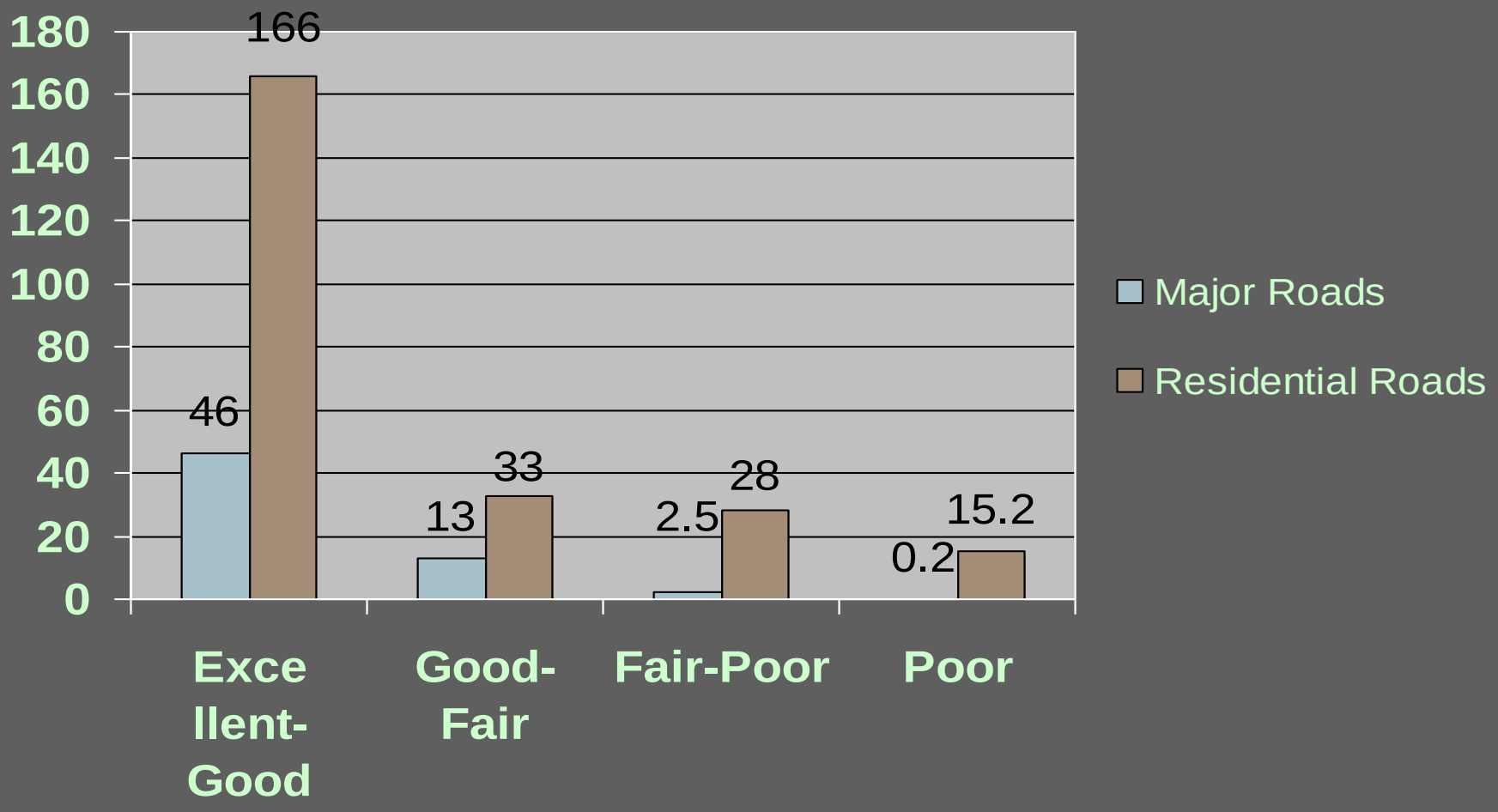
Pavement Condition Index (PCI) Calculation

- Survey Input Into VHB Road Manager 2000

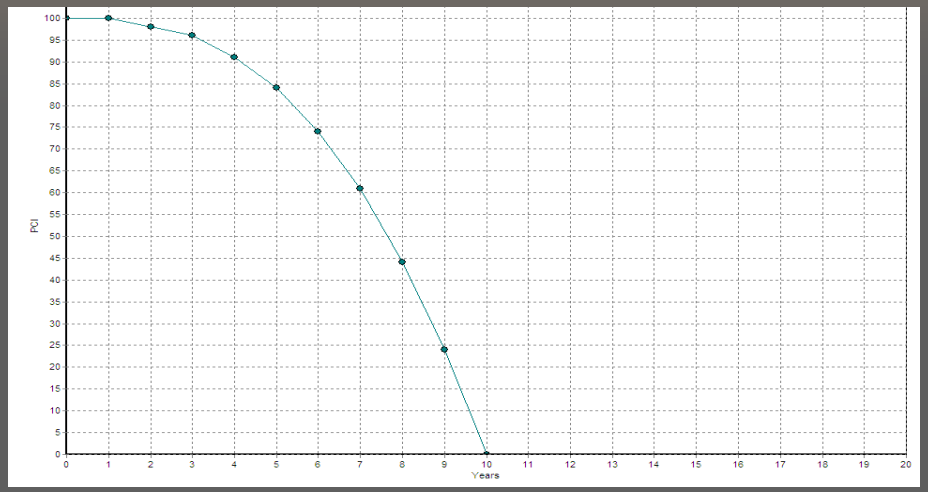
- PCI Calculated 100 - 0
  - 100 - 70 Excellent - Good
  - 69 - 50 Good - Fair
  - 49 - 36 Fair - Poor
  - 35 - 20 Poor
  - < 20 Needs reconstruction

Road Condition Summary – Miles

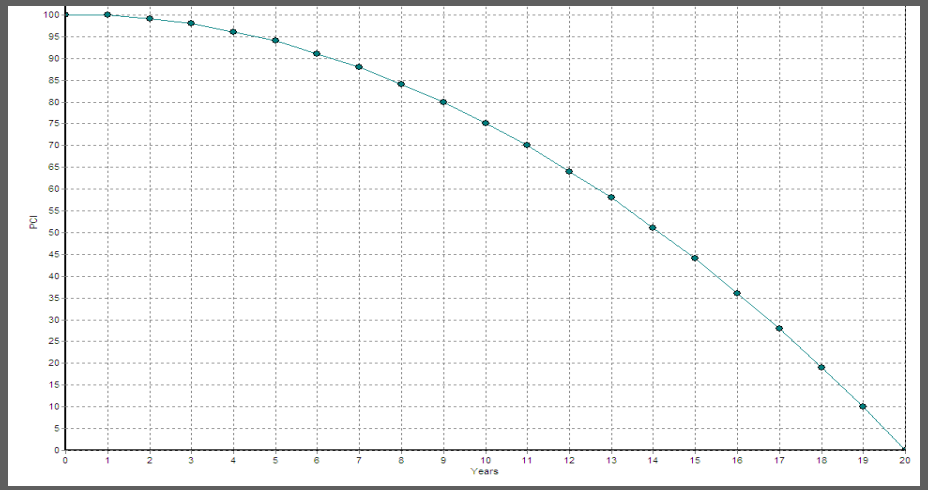
VHB ROAD MANAGER Pavement Inventory



PCI Decline Over Time



Major streets
7- to 10-yr life



Residential streets
15- to 20- yr life

Examples of Street PCIs

Street	PCI
Farley Rd	26
Amherst Terrace	23
Ayer St	35
Sawyer St	45
Essex St	48
Wason Ave	57
E St	67
East Stark St	73
Derby Cir	85
Murphy Dr	95

Benefit Value (BV) Calculation

- City uses VHB Budget Analysis

- $BV = \frac{\text{Daily Traffic x Repair Life}}{\text{Repair Cost x PCI}}$

  - Av Daily Traffic (ADT) from NRPC
  - Life - Major 10yr, Resident 20yr
  - Repair cost estimated on type of repair
  - PCI as calculated above

Examples of Benefit Values (BVs)

Street	BV
Dunstable Rd Interchange (Kinsley St approach)	268
Broad St from Hyannis St to City Line	125
Lock St from Tolles St to Railroad Bridge	80
French St	55
Fox St	46
Moe St	44
Monica Dr	30
Bruce St	25
Divinity Cir	20
Lear Dr	12

Annual Street List

- Goal to have a final list to fit budget ($ 1 Mil Annually)
- A 2+ yr ($2.5 Mil) draft list is prepared
  - Look ahead for budget planning including utilities and sewers
  - Coordinate work with utilities, sewer repairs, etc.
  - Streets may be deferred
- List consists of selections from two lists:
  - Primary streets selected by highest BV
  - Secondary streets selected by lowest PCI, typically <30
  - May add other low PCI (<35) streets if in neighborhood
  - Street conditions field verified
  - Some streets may suddenly deteriorate in winter
- Final list based on actual bid and coordination with other projects

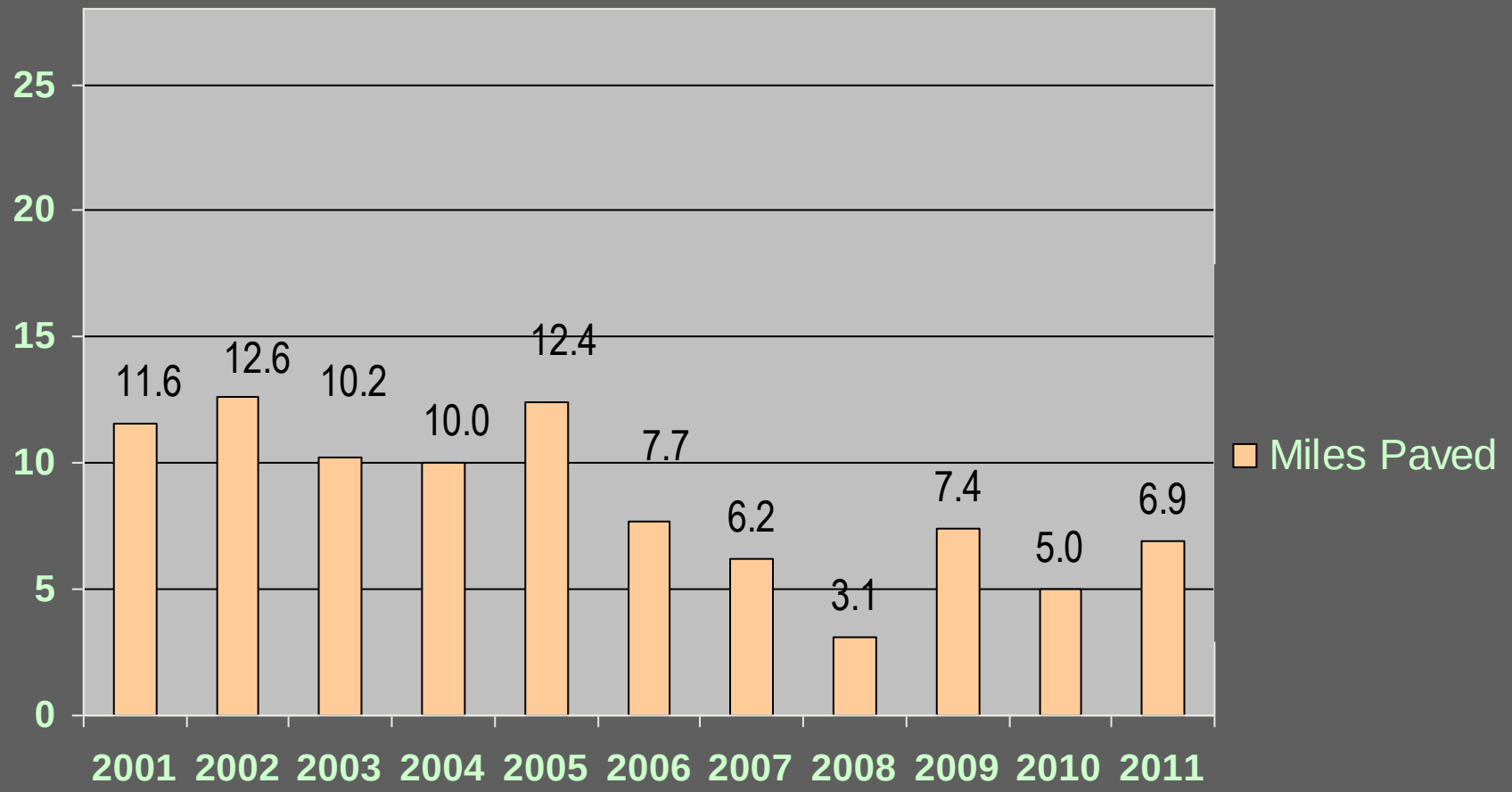
2011 Paving Primary Street (High BV) List

Segment	From	To	Length (ft)	Total Length (ft)	Total Length (miles)	BV	PCI
Route 111 East (Kinsley St Approach; Dunstable Rd Interchange)	Main Dunstable Rd	New Dunstable Rd	400	601	0.1	268	44
West Hollis St	No. 1100 West Hollis St	Hollis Town Line	500	1,101	0.2	198	47
Bridge St Ramps	Bridge St	Hudson Town Line	1590	2,691	0.5	174	41
E. Dunstable Rd	Browning Ave	Lamb Rd	2180	4,871	0.9	157	43
Broad St	Hyannis St	Hollis Town Line	1130	6,001	1.1	125	49
Pine Hill Rd	Crimson Ct	Hollis Town Line	980	6,981	1.3	119	36
E. Dunstable Rd	Clydesdale Cr	Browning Ave	2080	9,061	1.7	114	50
Lock St	Tolles St	RR Bridge	2040	11,101	2.1	80	40
Conant Rd	Rocky Hill Dr	# 55 Conant Rd	1675	12,776	2.4	66	43
Buckmeadow Rd	# 34 Buckmeadow Rd	# 49 Buckmeadow Rd	1300	14,076	2.7	63	34
Clement St	Orchard Ave	# 4 Clement St	1911	15,987	3.0	61	47
Charlotte Ave	Meade St	Charlotte St	830	16,817	3.2	58	49
Bicentennial Dr	East Dunstable Rd	Turnbridge Dr	1352	18,169	3.4	57	38
Bicentennial Dr	Turnbridge Dr	Whitman Rd	844	19,013	3.6	54	37
Hills Ferry Rd	Smithfield Terr. (West)	Old Mill Ln	1640	20,653	3.9	52	34
Fairmount St	Baldwin St	450' East of Baldwin St	450	21,103	4.0	51	36
Tufts Dr	Hills Ferry Rd	Hills Ferry Rd	1407	22,509	4.3	50	31

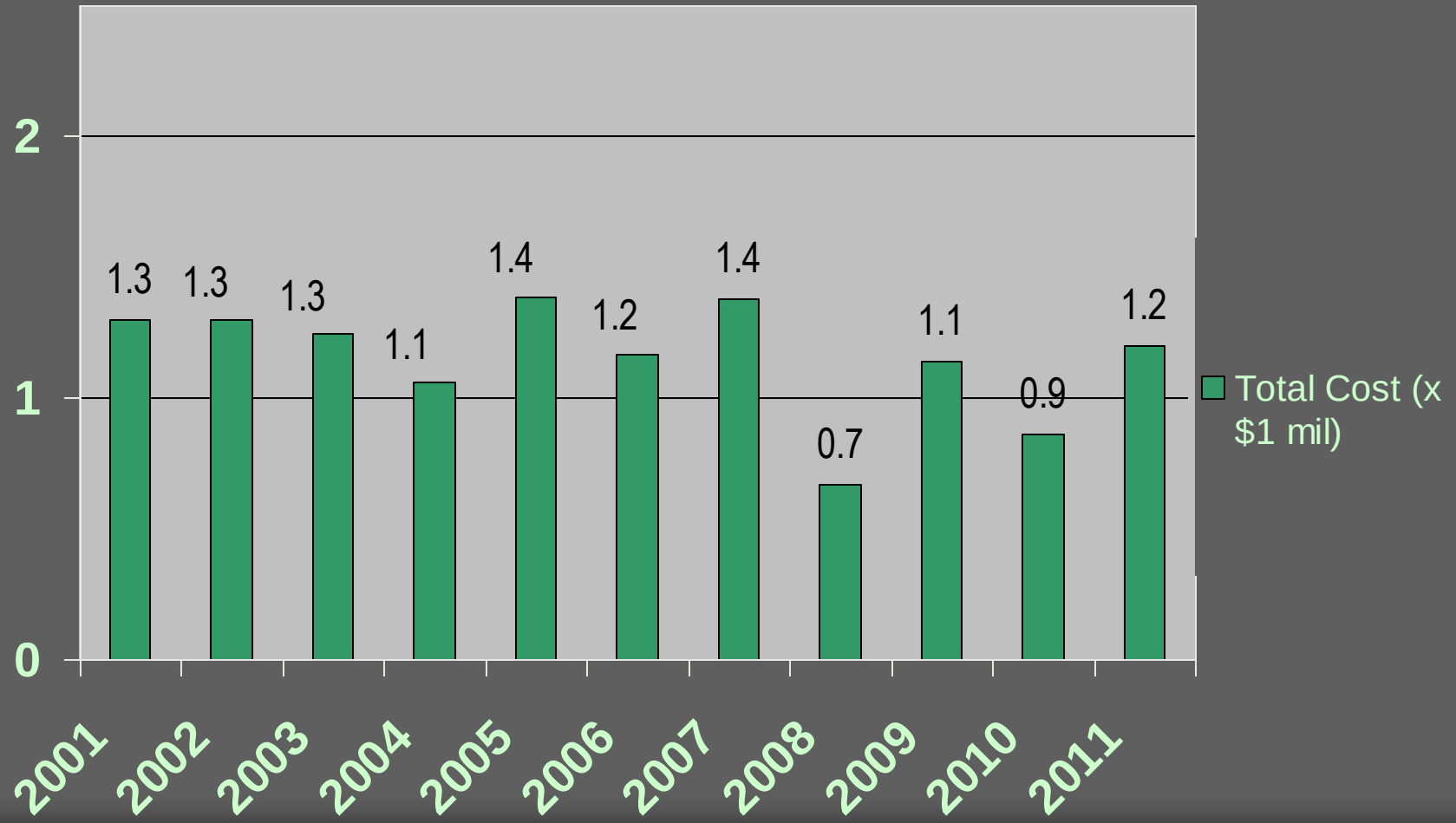
2011 Paving Secondary Streets (Low PCI)

Street	From	To		PCI
Amherst Terrace	Amherst St	Broad St		*23*
Beverlee Dr	Hills Ferry Rd	End		*21*
Bordeaux St	Lund Rd	End		*26*
Brookfied Dr	Broad St	Hollis Town Line		*26*
Cheyenne Dr	Southern End	27 Cheyenne Dr		*26*
Edwards Ave	Birchbrow Rd	End		*25*
Farley Rd	Hollis Town Line	Hollis Town Line		*26*
Middle Dunstable Rd	103 Middle Dunstable Rd	Dion Dr		*19*
North Groton St	First St	Seventh St		*26*
Parrish Hill Dr	Broad St toward Cardinal Circle	Cathedral Circle		*30*
Sanborn Dr	Denver Dr	Cheyenne Dr		*25*
Upstone Dr	Carmine Rd	Sioux Ave		*30*

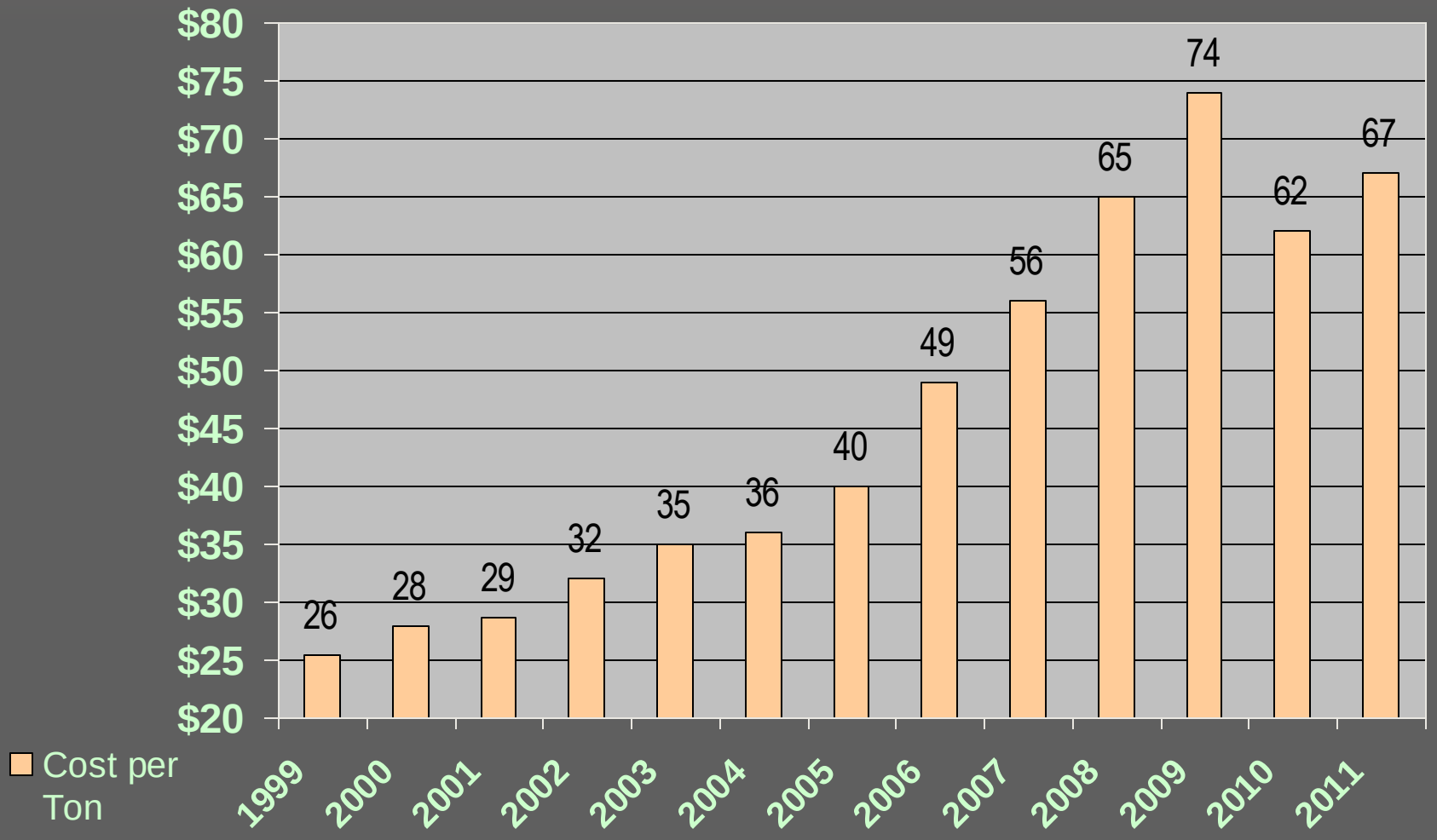
Miles of Road Paved per Year
2001 – 2010



Annual Total Spending on Paving
2001 – 2011



Asphalt Costs per Ton
FY 1999 – FY 2011



Annual Paving Cost Per Mile
2001 – 2011