

PROSPECTS FOR DEVELOPMENTAL DISABILITIES SERVICES IN AN AGE OF ECONOMIC UNCERTAINTY

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**American Association on Intellectual &
Developmental Disabilities (AAIDD)**
Texas State Chapter
Corpus Christi, Texas
July 15, 2009

I. THE INSTITUTIONAL ERA: 1403-1963

***II. MOVEMENT TOWARD COMMUNITY:
1963-THE PRESENT***

- ECONOMIC UNCERTAINTY***

***III. EMERGING TECHNOLOGY
APPLICATIONS IN RESIDENTIAL
SERVICES AND PERSONAL SUPPORT
FOR PEOPLE WITH I/DD***

FIRST MENTAL DISABILITY INSTITUTIONS

BETHLEHEM, LONDON, ENGLAND (1403)

VALENCIA, SPAIN (1409)

ZARAGOZA (1425)

SEVILLE (1436)

VALLADOLID (1436)

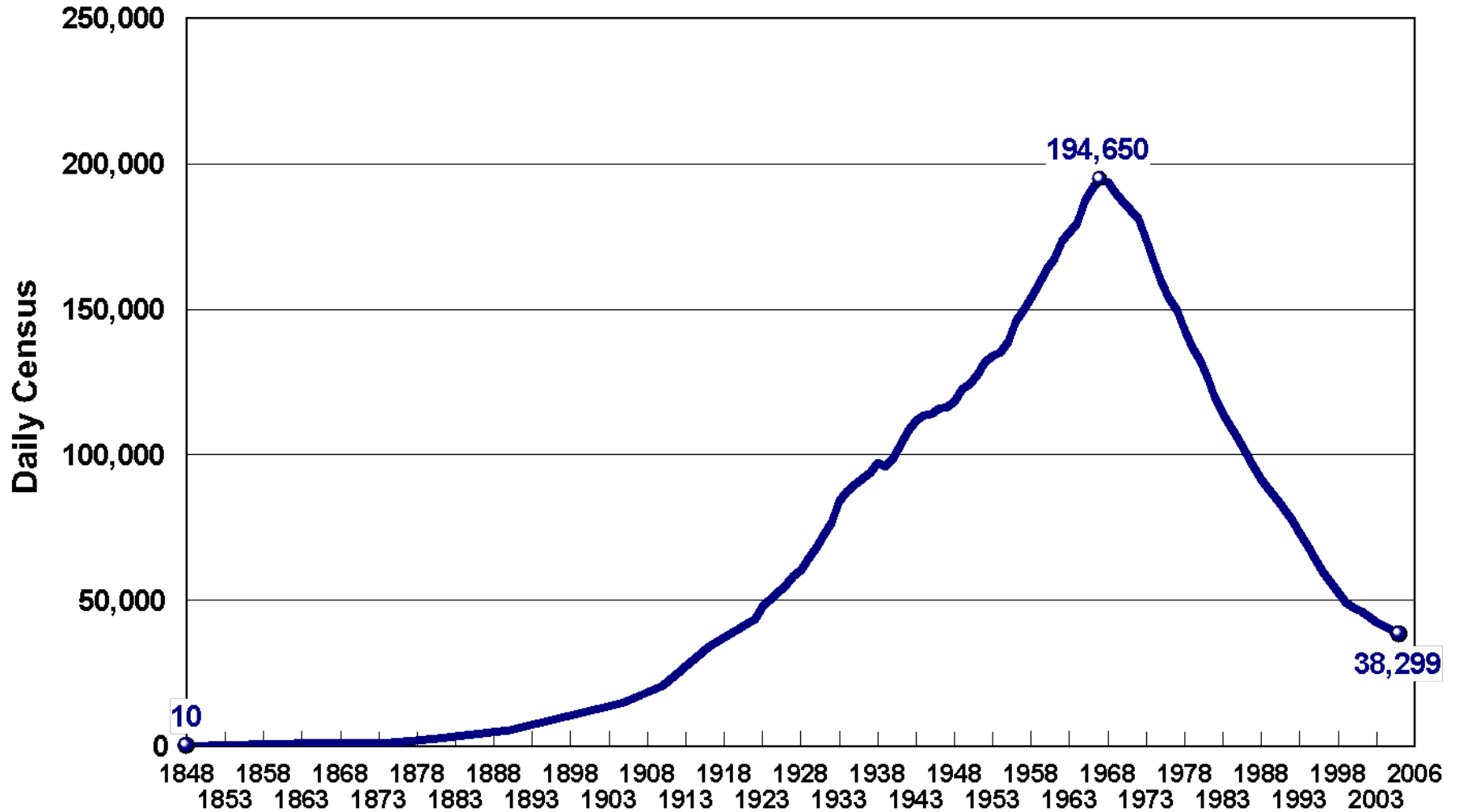
PALMA MAJORCA (1456)

TOLEDO (1480)

GRANADA (1527)

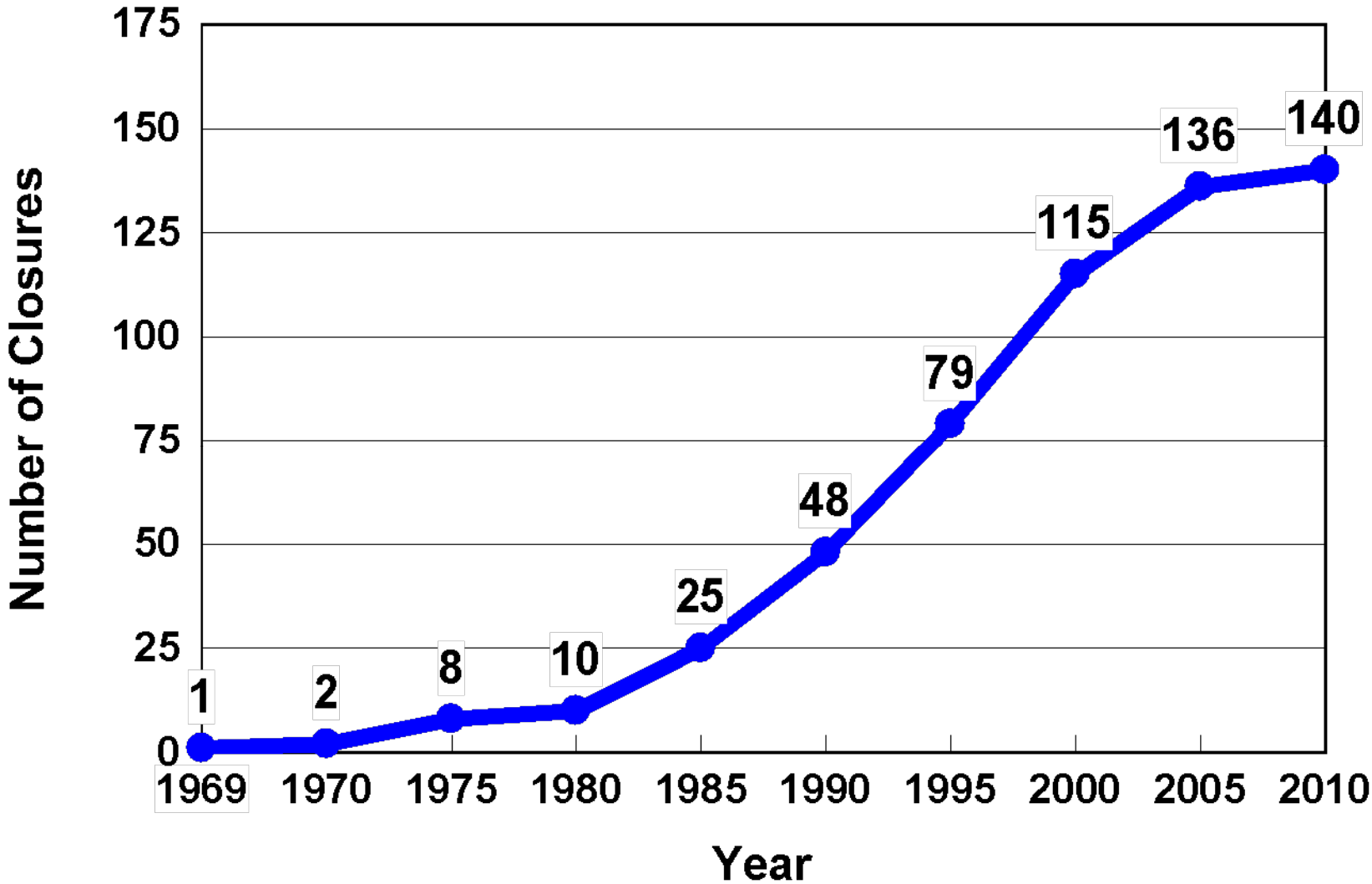
SAN HIPOLITO (1566, First in North America)

DAILY CENSUS OF STATE I/DD INSTITUTIONS, 1848-2006



Source: Braddock, D., State of the States in Developmental Disabilities, 2008.

CUMULATIVE NUMBER OF CLOSURES OF STATE-OPERATED 16+ INSTITUTIONS IN THE U.S.: 1960-2010



Source: Braddock, D., Coleman Institute and Department of Psychiatry, University of Colorado, 2008.

STATE SCHOOLS IN TEXAS: AVERAGE DAILY CENSUS IN 2009

1	Denton State School	610
2	Abilene State School	503
3	Mexia State School	493
4	Richmond State School	476
5	Lufkin State School	423
6	Austin State School	419
7	Brenham State School	381
8	Corpus Christi State School	348
9	San Angelo State School	285
10	San Antonio State School	283
11	Lubbock State School	255
12	El Paso State Center	140
13	Rio Grande State Center	84
	TOTAL	4,700

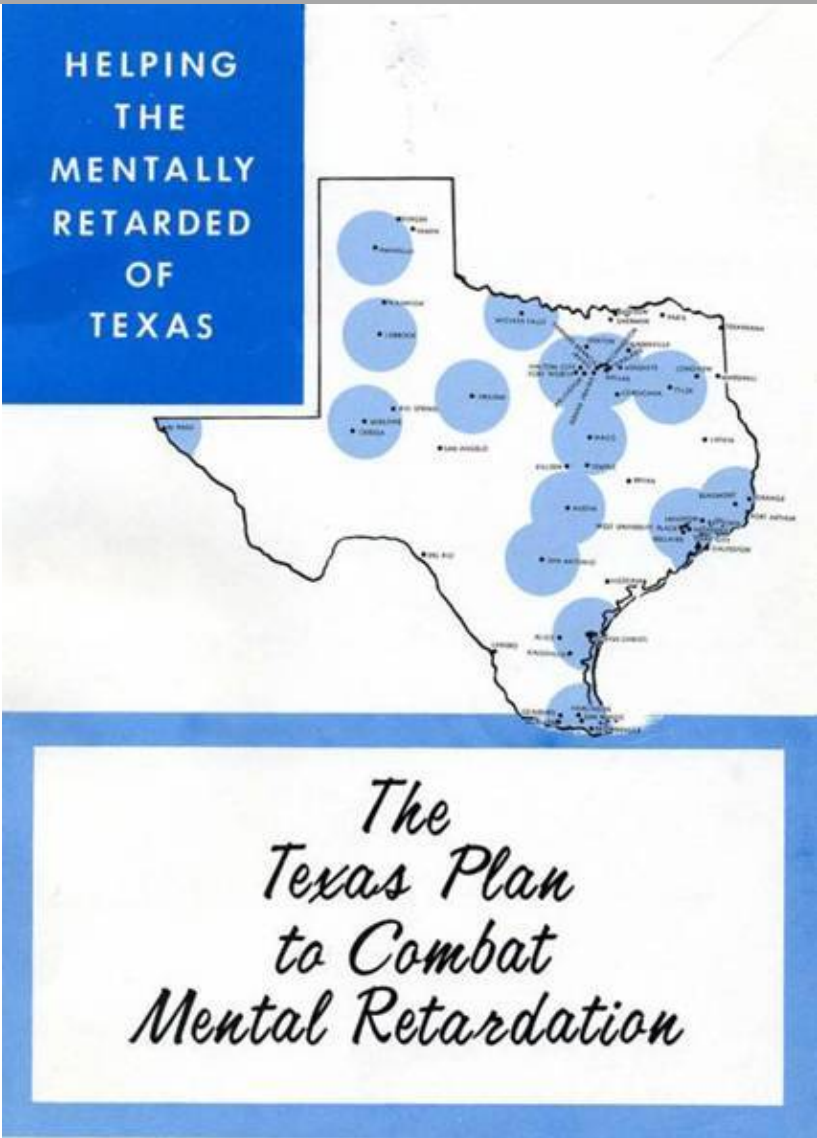
Source: Braddock, D., State of the States in Developmental Disabilities, 2009.

II. MOVEMENT TOWARD COMMUNITY 1963 – PRESENT

- **ENACTMENT OF PUBLIC LAW 88-156
AND PUBLIC LAW 88-164**

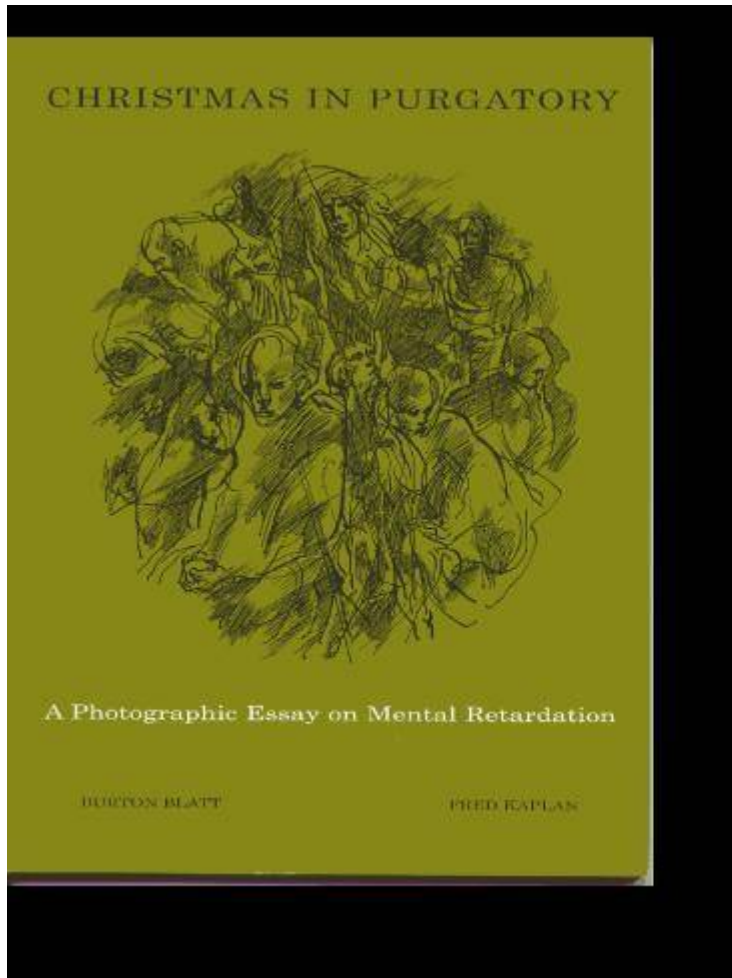
PRESIDENT KENNEDY SIGNING PL 88-164





Source: Braddock, D., University of Colorado, 2008.

NEW YORK STATE MENTAL RETARDATION INSTITUTION, CIRCA 1967



Christmas in Purgatory



Source: Braddock, D., University of Colorado, 2008.

STATES WITHOUT STATE-OPERATED I/DD INSTITUTIONS IN 2009

- 1. ALASKA**
- 2. DISTRICT OF COLUMBIA**
- 3. HAWAII**
- 4. INDIANA**
- 5. MAINE**
- 6. MINNESOTA**
- 7. NEW HAMPSHIRE**
- 8. NEW MEXICO**
- 9. RHODE ISLAND**
- 10. VERMONT**
- 11. WEST VIRGINIA**

Source: Braddock, D., State of the States in Developmental Disabilities, 2009.

WHO'S NEXT? 10 STATES BELOW 150 RESIDENTS

SMALLEST INSTITUTIONAL CENSUS	
1 Oregon	40
2 Nevada	62
3 Montana	77
4 Wyoming	88
5 Idaho	90
6 Delaware	99
7 Colorado	105
8 Michigan	127
9 North Dakota	130
10 Arizona	134

Source: Braddock, D., State of the States in Developmental Disabilities, 2009.

Most data are for 2006. Red data are for 2008.

TEN STATES WITH 1,300 + RESIDENTS

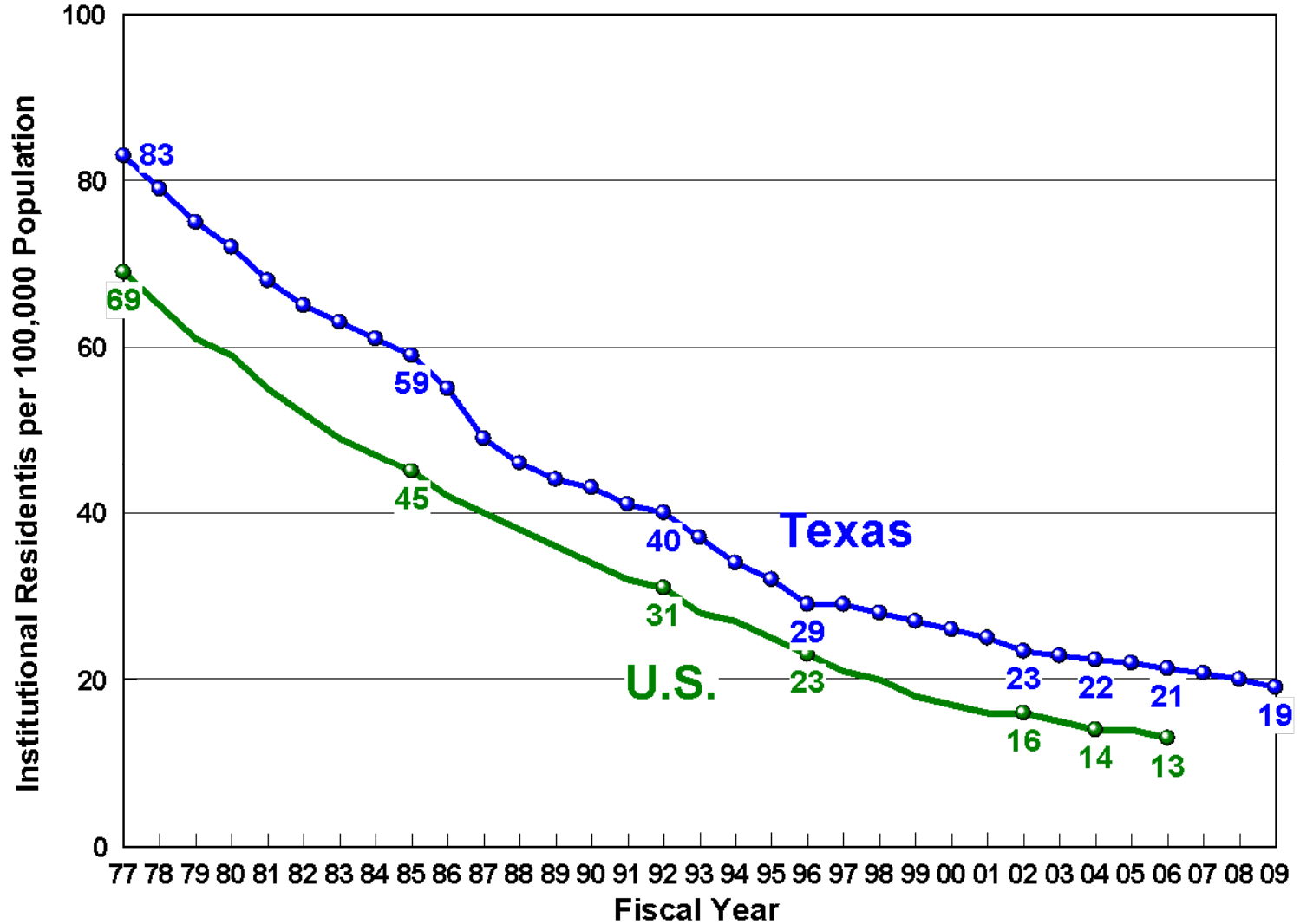
LARGEST INSTITUTIONAL CENSUS

1 Texas	4,700
2 California	3,025
3 New Jersey	2,953
4 Illinois	2,470
5 New York	1,605
6 North Carolina	1,605
7 Ohio	1,492
8 Virginia	1,452
9 Pennsylvania	1,416
10 Mississippi	1,377

Source: Braddock, D., State of the States in Developmental Disabilities, 2009.

Most data are for 2006. Red data are for 2008. Texas data are for 2009.

DECLINING STATE SCHOOL UTILIZATION RATES: TEXAS EXCEEDED THE U.S. BY 62% IN 2006



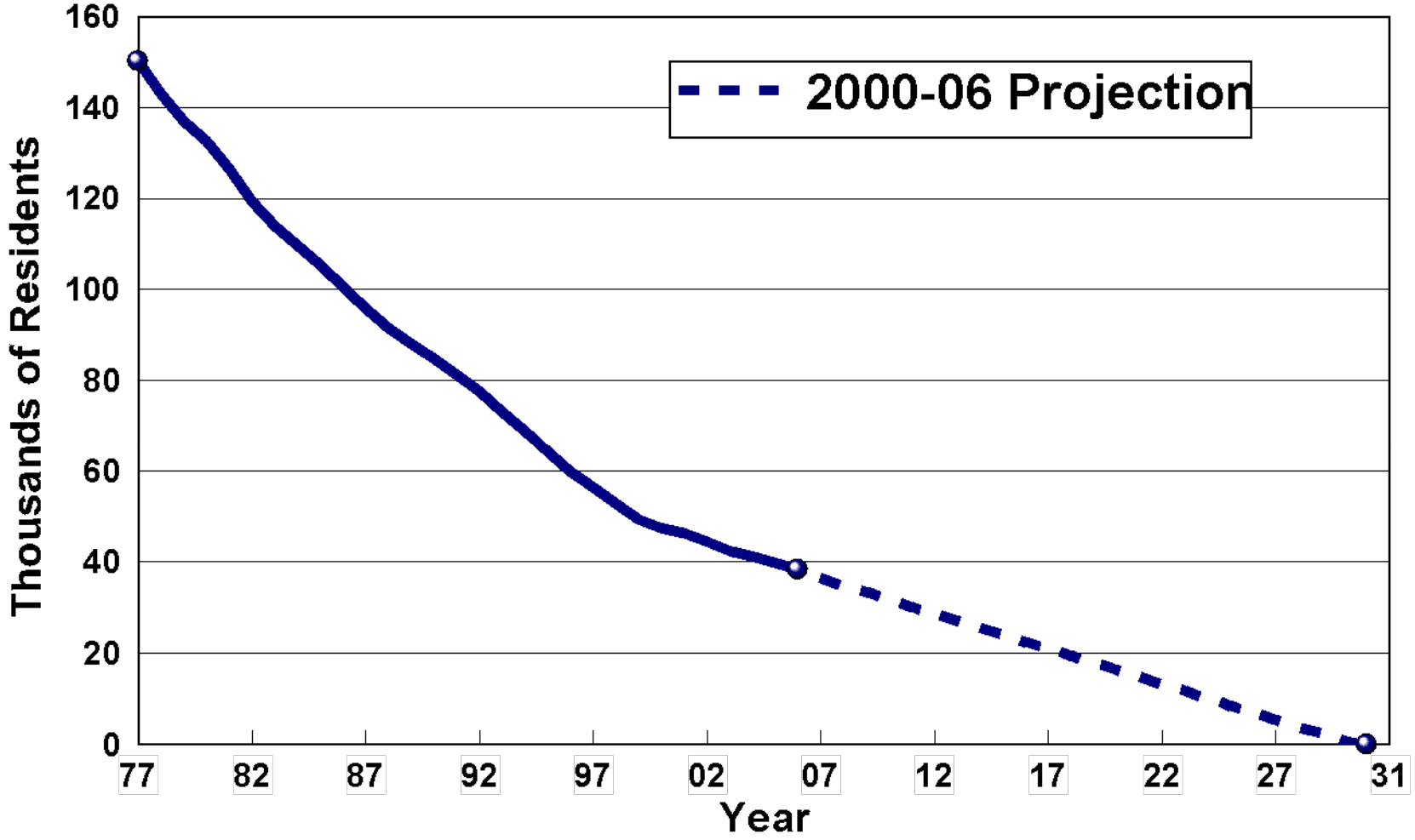
Source: Braddock, D., State of the States in Developmental Disabilities, 2009.

TEXAS:	\$297*
U.S.:	\$469
HIGHEST STATE (NY):	\$994
LOWEST STATE (FL):	\$266

***Texas' 2006 per diem ranked 2nd lowest of the 40 states with institutions. Texas' 2009 per diem is \$379.**

WILL THERE ALWAYS BE STATE-OPERATED INSTITUTIONS?

UNITED STATES



Source: Braddock, D., State of the States in Developmental Disabilities, 2009.

ALTERNATE INSTITUTIONAL USE FOR 140 U.S. INSTITUTIONAL CLOSURES

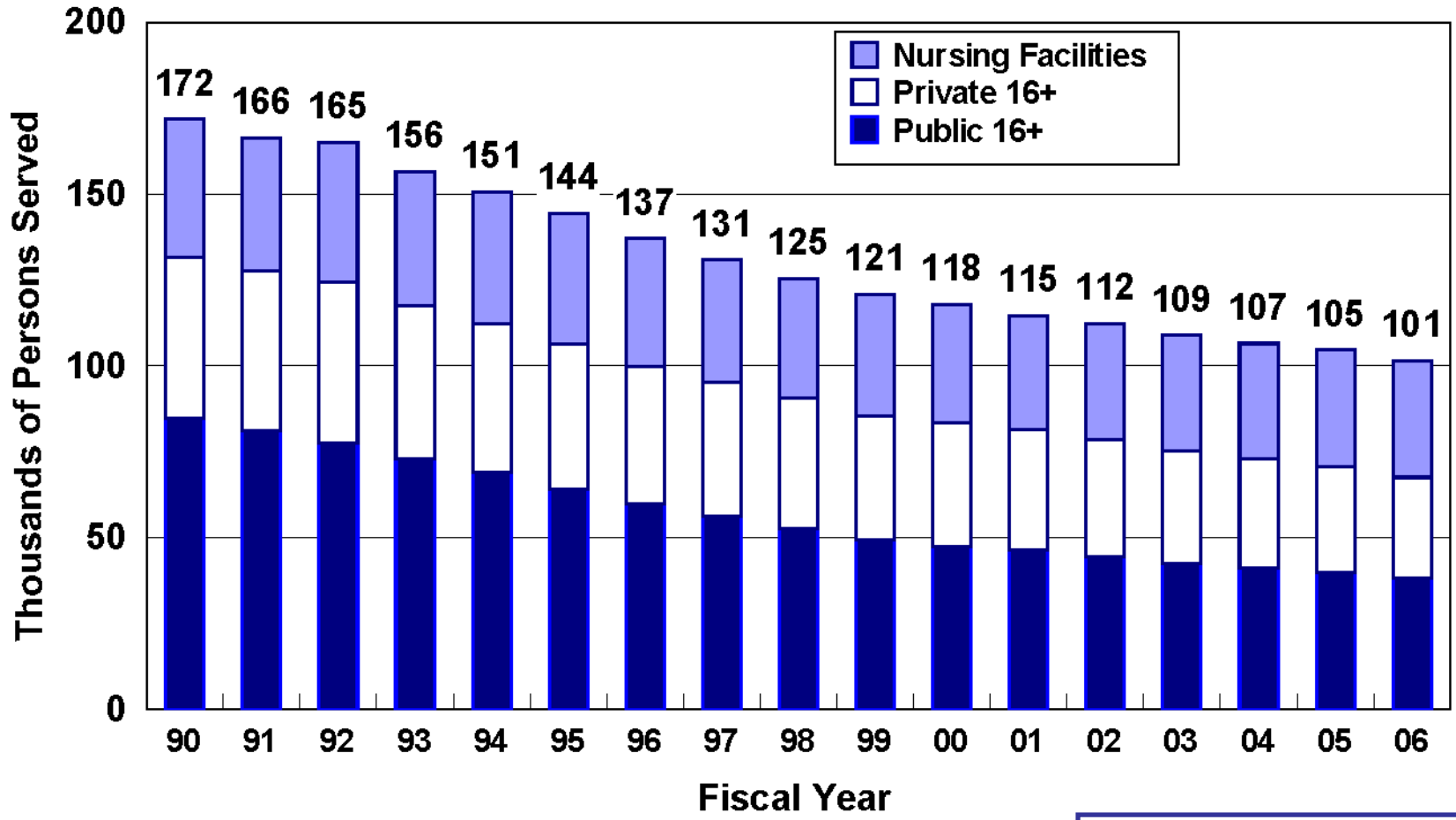
Alternate Use	Number ¹
Corrections (including federal corrections)	24
DD or other state/local administrative offices	18
Universities/junior colleges	12
Property vacant	10
Demolished	8
To be sold (including realty, public auction)	7
Community DD programs	5
MI facilities	4
Private institutions	4
Housing	3
New MR facilities	3
Nursing facilities	3

Alternate Use	Number ¹
Various community uses	2
Retirement program	2
Art Center for PWD	1
Commercial	1
Juvenile facility	1
National Guard Urban Training Center	1
Public health infirmary	1
Reverting to U.S. Department of Defense	1
Unoccupied (asbestos)	1
Veterans' medical center	1
Women's prison	1
Undetermined	38

¹Total is 152--12 institutions had two alternate uses

Source: Braddock, D., State of the States in Developmental Disabilities, 2008.

UNITED STATES

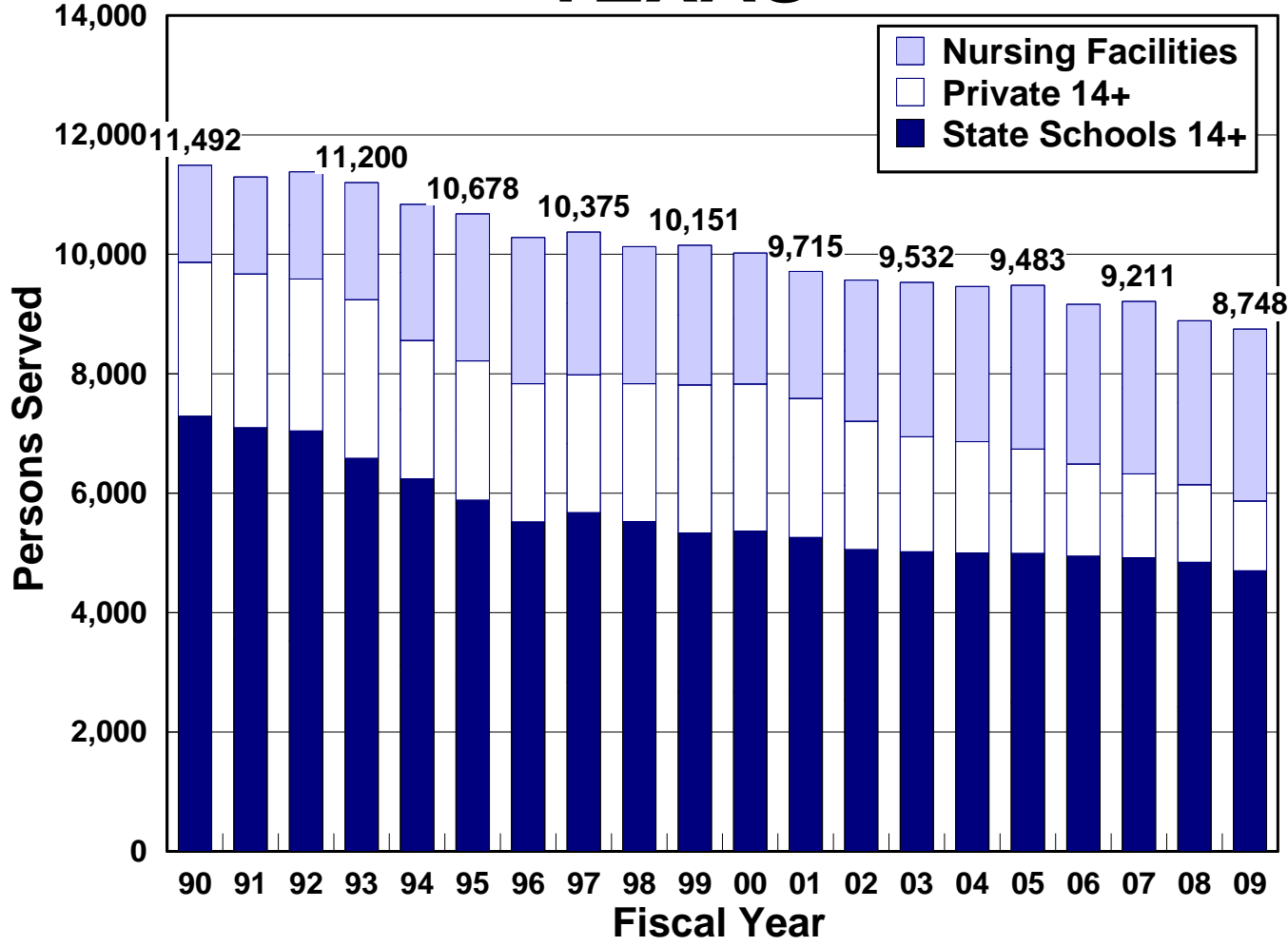


**Utilization Rate:
34 per 100,000**

Source: Braddock, D., State of the States in Developmental Disabilities, 2008.

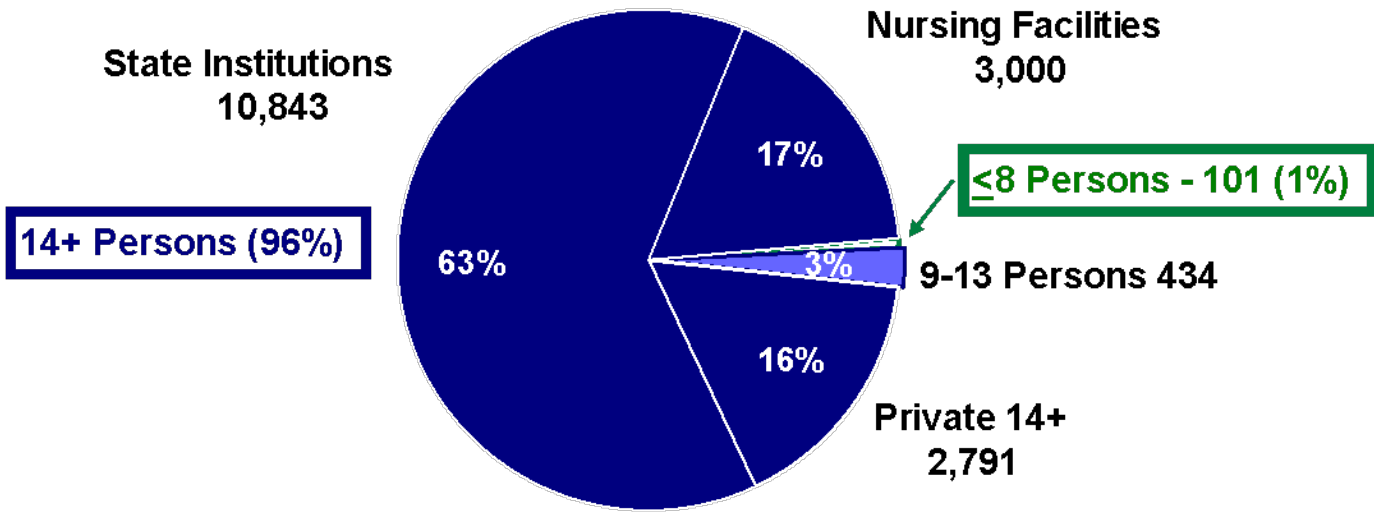
PUBLIC AND PRIVATE INSTITUTIONALIZATION FOR PERSONS WITH I/DD IS DECLINING

TEXAS



2006 Utilization Rate: 40 per 100,000 (14th highest). Note general reduction, with slight increases in 1992, 1997, 1999, 2005 and 2007

TEXAS



Residential Services Total: 17,169

**Utilization Rate:
131 per 100,000**

Source: Braddock, D., State of the States in Developmental Disabilities, 2008.

**WHAT WAS THE GROWTH IN TEXAS'
GENERAL POPULATION DURING
1977-2009?**

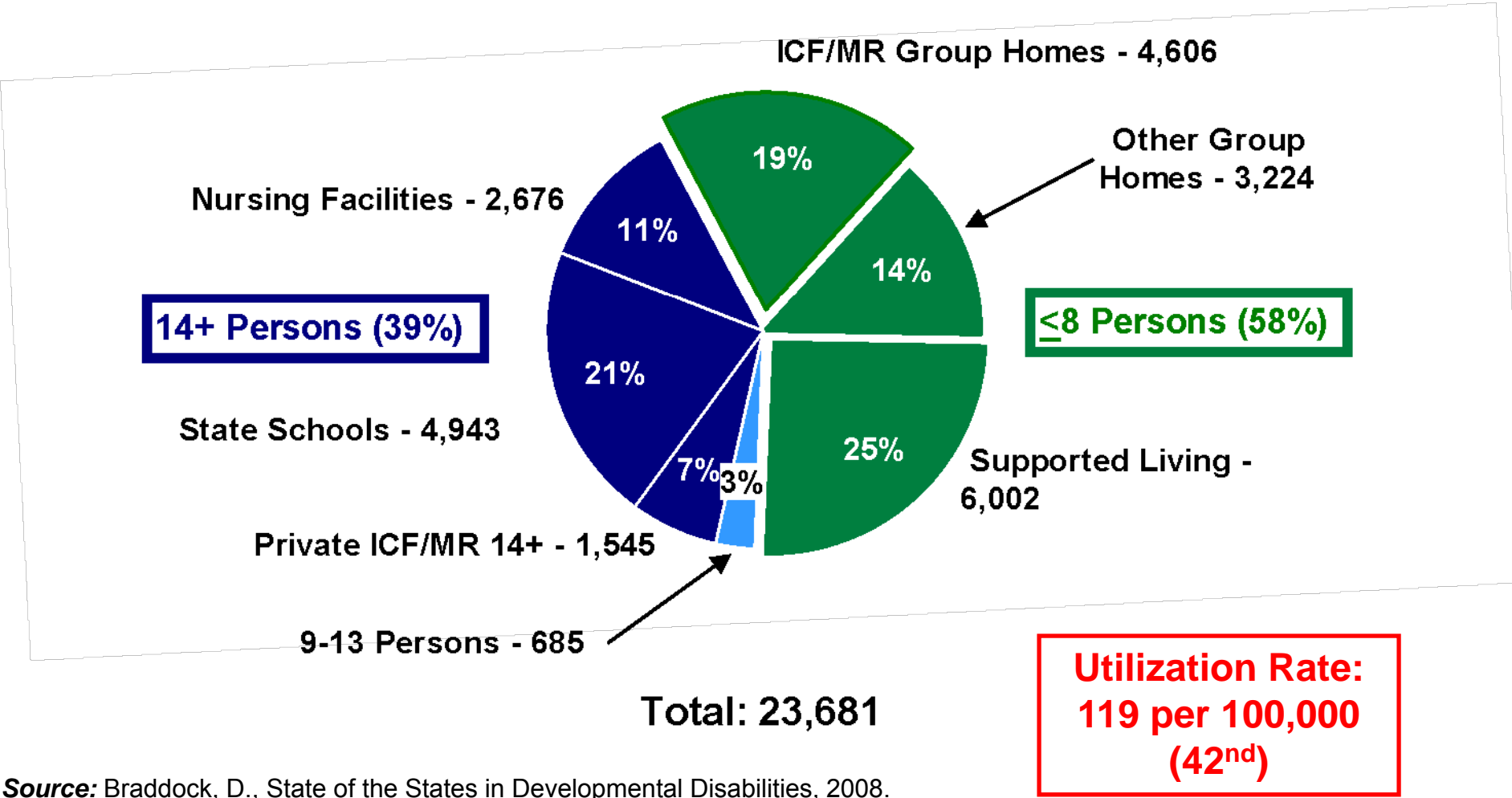
**WHAT WAS THE GROWTH IN
I/DD SERVICES DURING
THE SAME PERIOD?**

DURING 1977-2009:

- **TEXAS' GENERAL POPULATION INCREASED 88%, TO 24.3 MILLION**
- **TEXAS' I/DD RESIDENTIAL SERVICES INCREASED ONLY 38%**

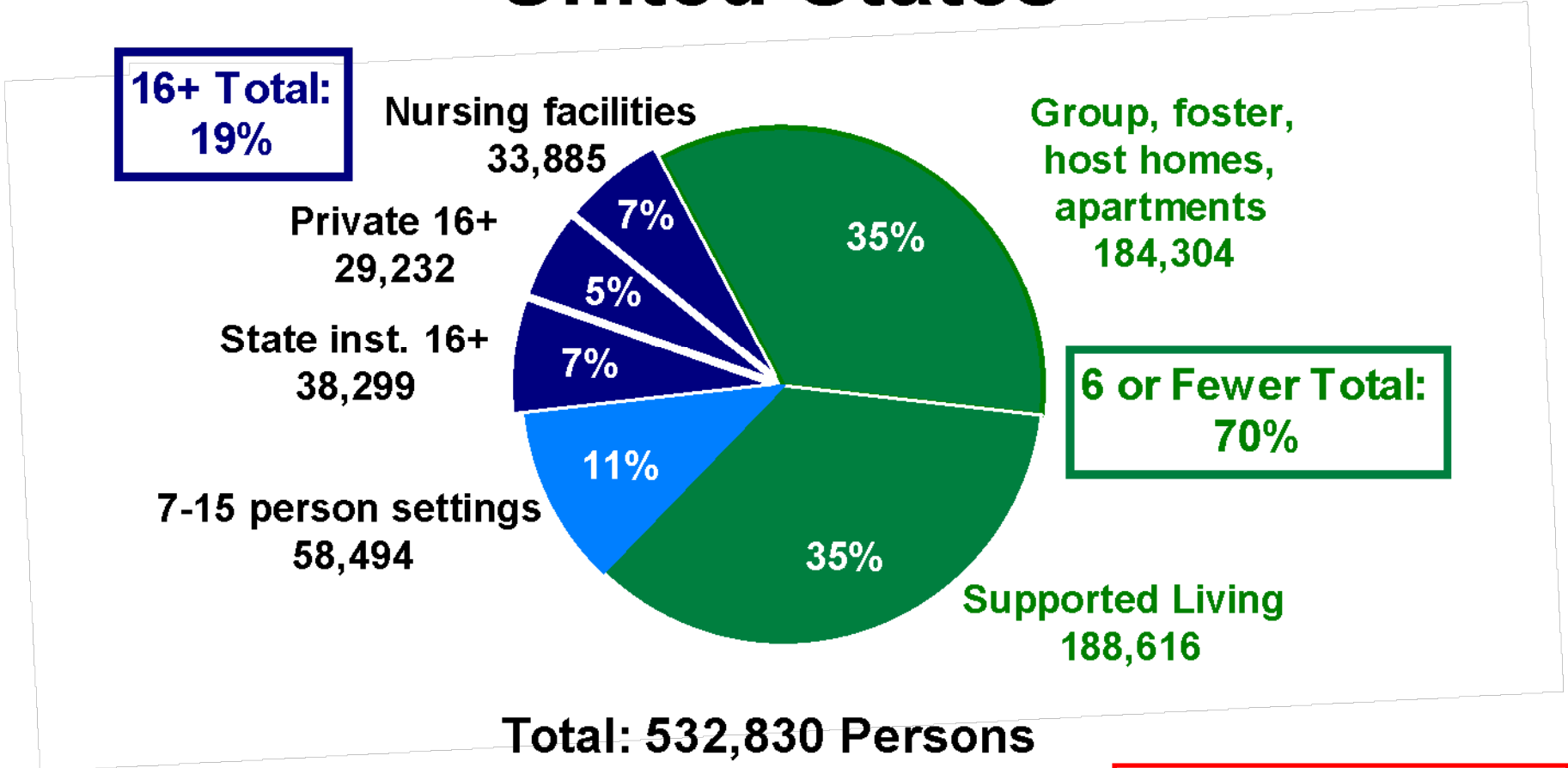
INDIVIDUALS WITH I/DD IN OUT-OF-HOME PLACEMENTS 30 YEARS LATER: 2006

TEXAS



Source: Braddock, D., State of the States in Developmental Disabilities, 2008.

United States

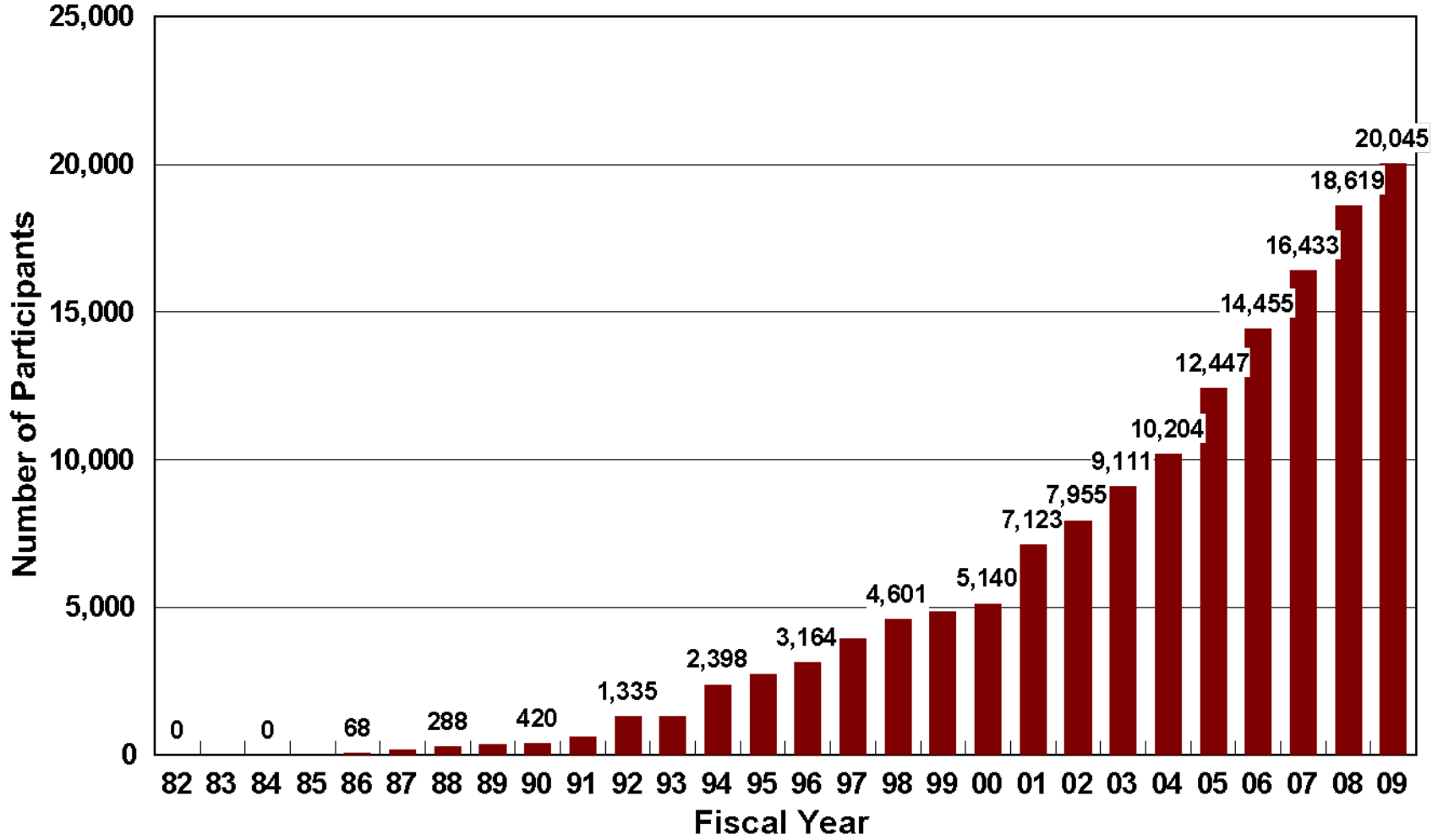


Source: Braddock, D., State of the States in Developmental Disabilities, 2008.

**IMPORTANCE OF THE
HOME AND COMMUNITY
BASED SERVICES
(HCBS) WAIVER**

HCBS WAIVER PARTICIPANT GROWTH: 1982-2009*

TEXAS



Source: Braddock, D., State of the States in Developmental Disabilities, 2009. *Includes Home and Community-Based Services (HCS) and Community Living Assistance and Support Services (CLASS) Waivers.

- **Case management; transition assistance;**
- **Adaptive aids; minor home modifications;**
- **Medical supplies; nursing;**
- **Adult foster care; residential care and/or assistance;**
- **Personal Emergency Response System (PERS)**
- **OT, PT, Speech Pathology, Audiology; specialized therapies**
- **Personal assistance;**
- **Home delivered meals; dietary**
- **Respite care;**
- **Supported employment; day habilitation;**
- **Dental, psychological services.**

AMONG THE HCBS WAIVER SERVICES NOT PROVIDED:

- *Assistive technology*
- *Community integration training*
- *Transportation*
- *Independent living skills training.*
- *Communication devices*
- *Nutritional counseling*
- *Private duty nursing*

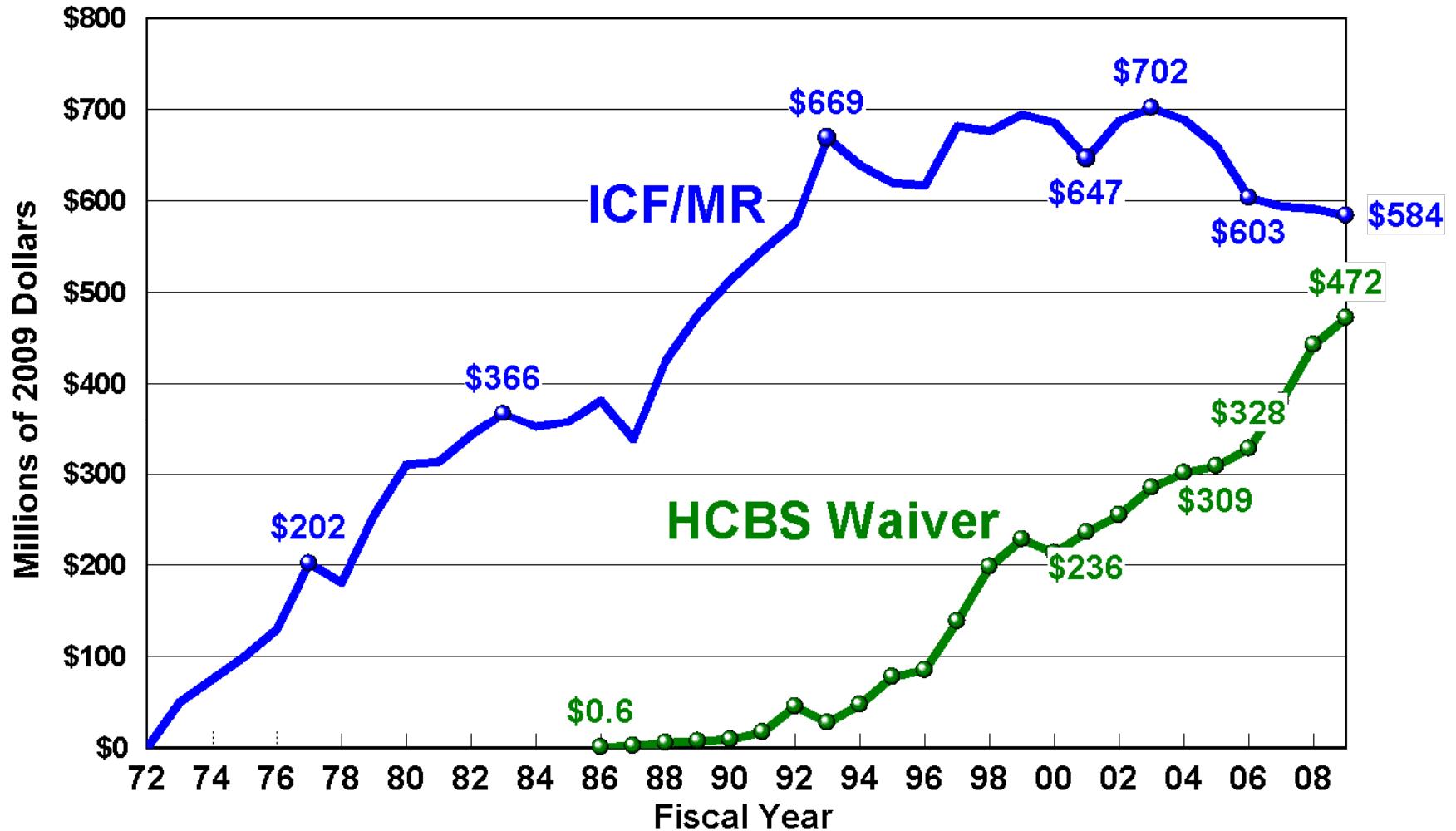
- Texas has two major HCBS Waivers for which persons with I/DD await services:
 1. Home and Community Services (HCS) Waiver: 41,011 persons on “interest list”
 2. Community Living Assistance and Support Services (CLASS) Waiver: 25,289 persons on “interest list”

Source: Texas Department of Aging and Disability Services (DADS) interest list.

*Duplicated Count.

FEDERAL MEDICAID SPENDING FOR I/DD LONG-TERM CARE

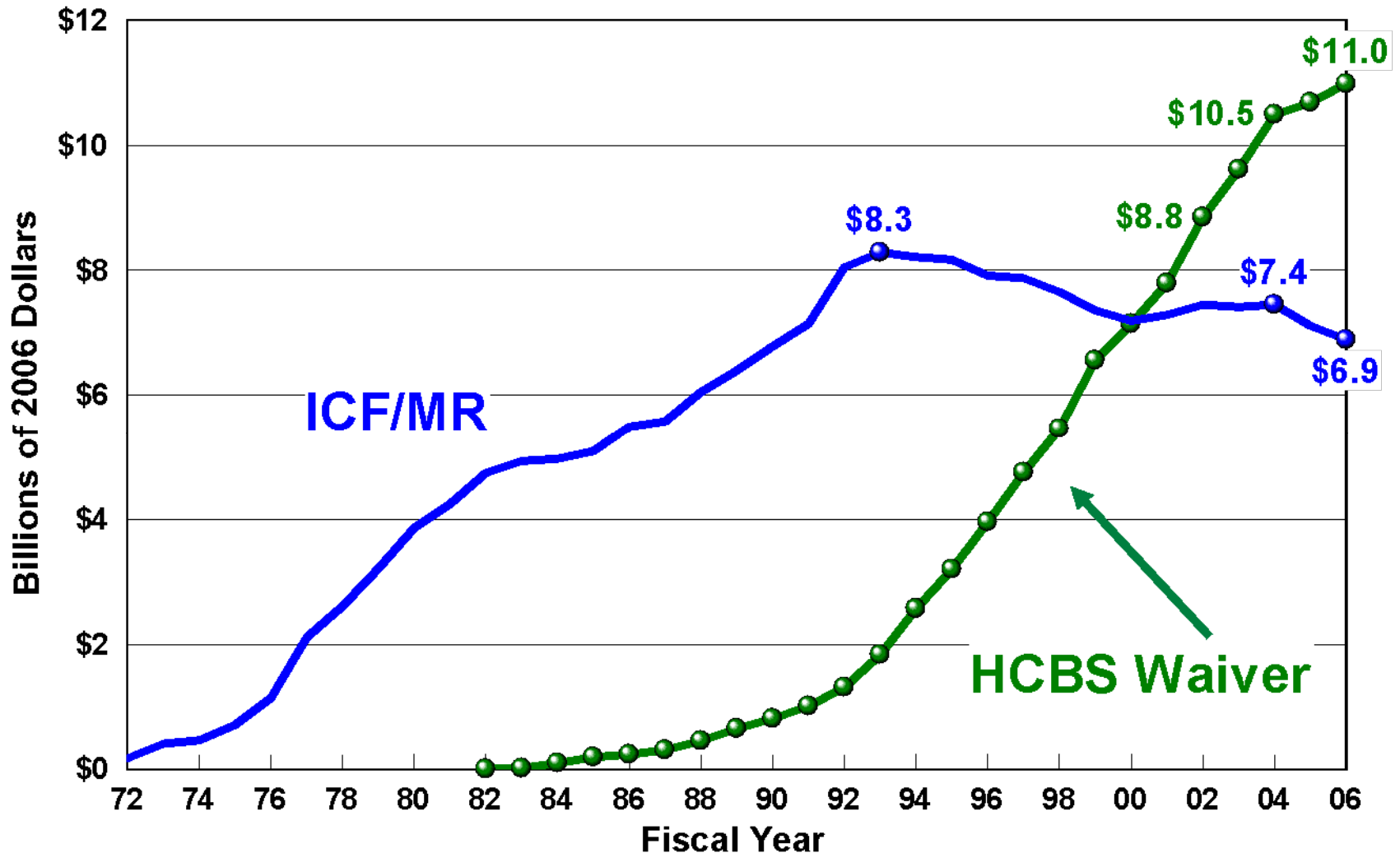
TEXAS



Source: Braddock, D., State of the States in Developmental Disabilities, 2009.

FEDERAL MEDICAID SPENDING FOR I/DD LONG-TERM CARE

UNITED STATES



Source: Braddock, D., State of the States in Developmental Disabilities, 2008.

FEDERAL-STATE HCBS SPENDING PER CAPITA, 2006: TEXAS TRAILS

1	Rhode Island	\$211
2	New York	\$188
3	Minnesota	\$169
4	Maine	\$167
5	Vermont	\$158
6	Wyoming	\$158
7	New Mexico	\$128
8	Connecticut	\$120
9	Alaska	\$113
10	New Hampshire	\$107
11	Pennsylvania	\$103
12	Massachusetts	\$102
13	South Dakota	\$100
14	Oregon	\$99
15	North Dakota	\$93
16	Wisconsin	\$82
17	Iowa	\$81

18	Kansas	\$80
19	Nebraska	\$78
20	Maryland	\$77
21	Delaware	\$76
22	Arizona	\$75
23	West Virginia	\$74
24	Tennessee	\$73
25	Michigan	\$71
26	Montana	\$67
27	Hawaii	\$65
28	Oklahoma	\$65
29	Washington	\$63
30	Colorado	\$62
31	Indiana	\$62
32	Ohio	\$60
33	Missouri	\$55
34	New Jersey	\$50

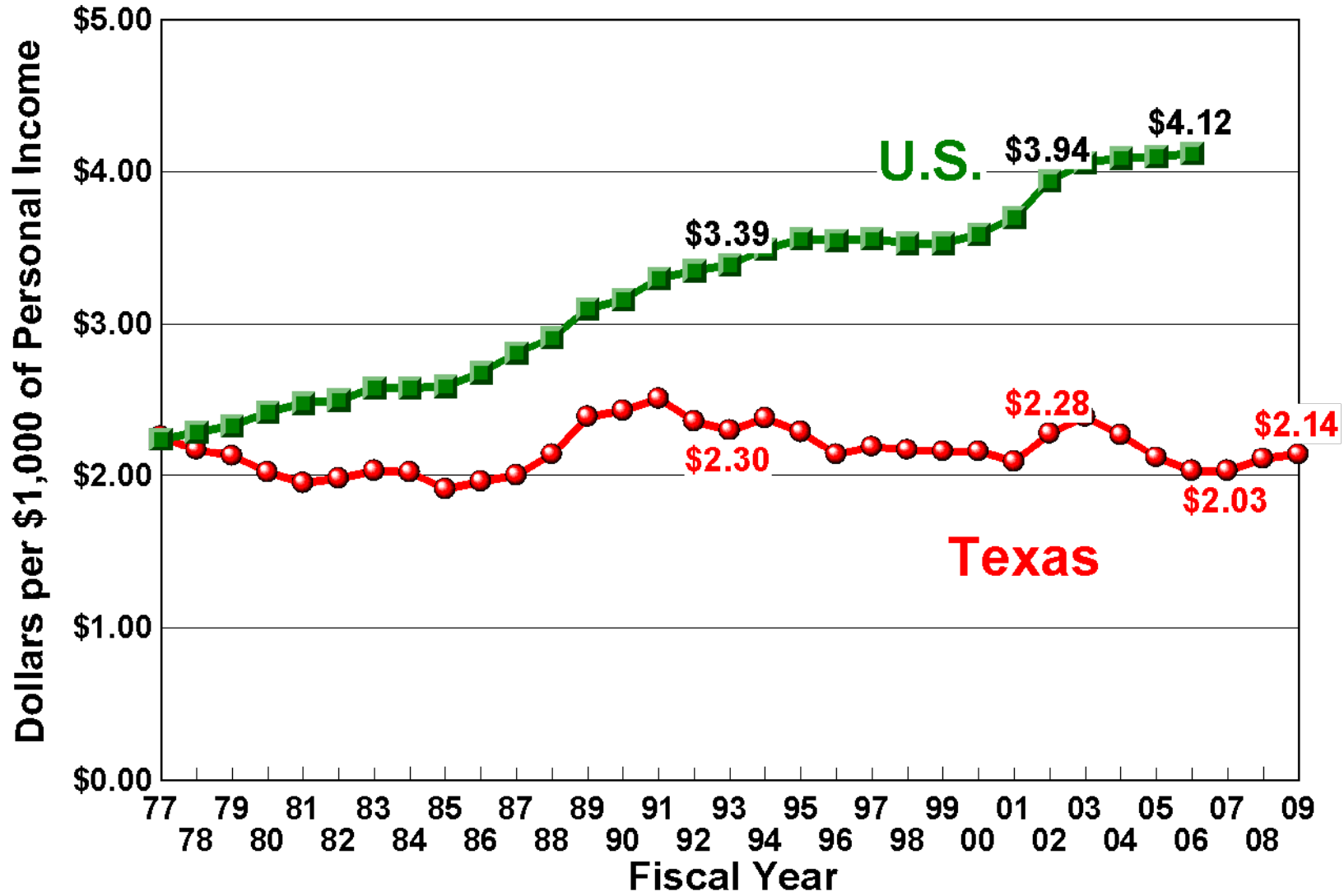
35	Louisiana	\$50
36	Utah	\$47
37	Alabama	\$46
38	South Carolina	\$45
39	Florida	\$43
40	Virginia	\$41
41	Idaho	\$40
42	Kentucky	\$37
43	California	\$37
44	North Carolina	\$36
45	Arkansas	\$33
46	DC	\$32
47	Illinois	\$32
48	Georgia	\$27
49	Nevada	\$23
50	Texas	\$20
51	Mississippi	\$12

UNITED STATES \$66

Six most populous states in red

Source: Braddock, D., State of the States in Developmental Disabilities, 2008.

I/DD FISCAL EFFORT IN THE UNITED STATES AND TEXAS



Source: Braddock, D., State of the States in Developmental Disabilities, 2009.

- **SUBSTANTIALLY EXPAND THE TEXAS HCBS WAIVERS**
 - **If Waiver spending in Texas matched the average state in 2006 it would have yielded an additional \$949 million in federal-state Waiver funding for community services, family support and supported employment**

- **In 1997 Governor Frank O'Bannon signed Senate Enrolled Act 317 establishing the "317 Task Force" of Indiana consumers, advocates, and state officials. In June 1998, the Task Force produced a *Comprehensive Plan* to address:**
 - **Waiting lists for services, and**
 - **Providing the necessary resources to support people with I/DD in their homes and at work.**

- Four developmental centers and six 16+ person private ICFs/MR closed between 1998 and 2007.
- The Indiana HCBS Waiver underwrote 86% of adjusted community spending growth from 1999 to 2008.
- In 2007 Indiana became the nation's largest state without reliance on I/DD public institutions.
- Inflation-adjusted community services spending in Indiana grew 85% during 1999-2008.

Braddock & Hemp. (2008). *Establishing a tradition of commitment: Intellectual and developmental disabilities services in Indiana*. Indianapolis: Institute on Disability and Community, IU; Indiana Governor's Council for People with Disabilities; Arc of Indiana; and Indiana Association of Rehabilitation Facilities, Inc.

- ***ECONOMIC UNCERTAINTY***

ROOTS AND CHARACTERISTICS OF ECONOMIC UNCERTAINTY

Simon Mikhailovich is an investment –fund manager who specializes in distressed structured credit, including collateralized debt obligations (C.D.O.s), formerly high-flying and now leaden assemblages of securitized debt. In 2005 he sensed that the loans underlying many C.D.Os, subprime and otherwise, were lousy and unlikely to be repaid. “Leveraging overpriced assets never worked for anyone.”

He applied the analogy of poultry. You can turn a bunch of whole chickens into packages of chicken parts, of ascending quality, from gizzards to breasts, and charge a premium for the best cuts. The butcher gets paid, and the shopper gets what he wants. The problem was, eventually, that gizzards were packaged as breasts. And then there was the salmonella. This reminded me of a cruder fowl-related C.D.O. critique: “You can’t make chicken salad out of chicken s- - -.”

It is true: the peddlers of the chicken s- - - paid to have it magically pronounced chicken salad, a conflict of interest that most investors ignored. The recipe may have originated in the mathematical models of the banks, but it acquired its irresistible allure with the acquiescence of the raters, whether it was winking or pie-eyed. “They were the ultimate fulcrum, the enablers,” Mikhailovich said.

Simon Mikhailovich, quoted in Nick Paumgarten, “The Death of Kings,” *New Yorker*, 5/8/09, pp. 48-49.

Beyond Collateralized Debt Obligations (CDOs)

It is true that the crisis was greater than the collapse of the subprime-mortgage market. As the economics professor Nouriel Roubini wrote earlier this year, in *Foreign Policy*, “The credit excesses that created this disaster were global. There were many bubbles, and they extended beyond housing in many countries to commercial real estate mortgages and loans, to credit cards, auto loans, and student loans. There were bubbles for the securitized products that converted these loans and mortgages into complex, toxic, and destructive financial instruments. And there were still more bubbles for local government borrowing , leveraged buyouts, hedge funds, commercial and industrial loans, corporate bonds, commodities, and credit default swaps....Taken together, these amounted to the biggest asset and credit bubble in human history.”

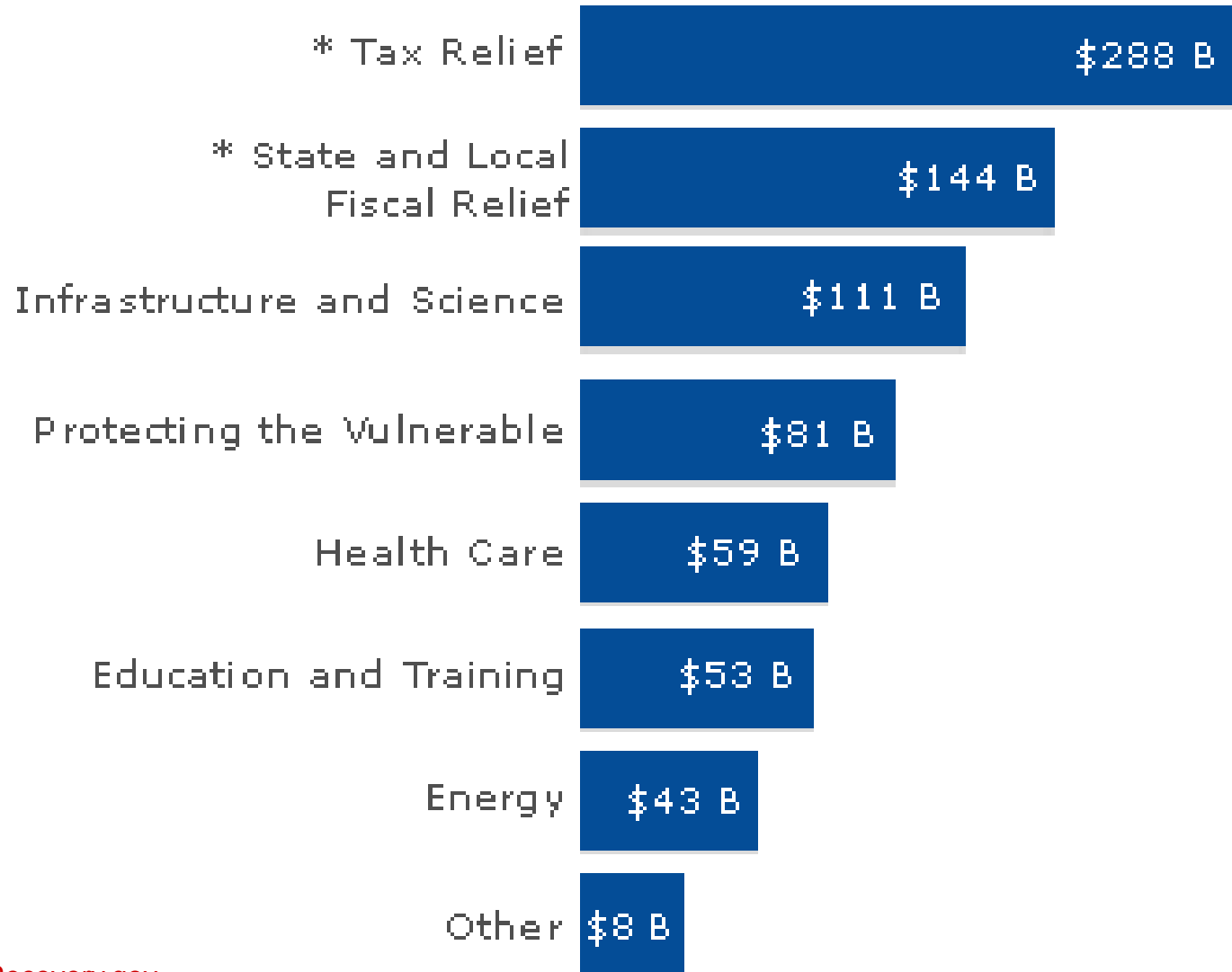
C. Bruck, “Angelo’s Ashes,” *New Yorker*, 6/29/09, p. 54.



NEVAT

"Now we just have to sit back and wait for the Fed to bail us out."

AMERICAN RECOVERY AND REINVESTMENT ACT (ARRA): \$787 Billion



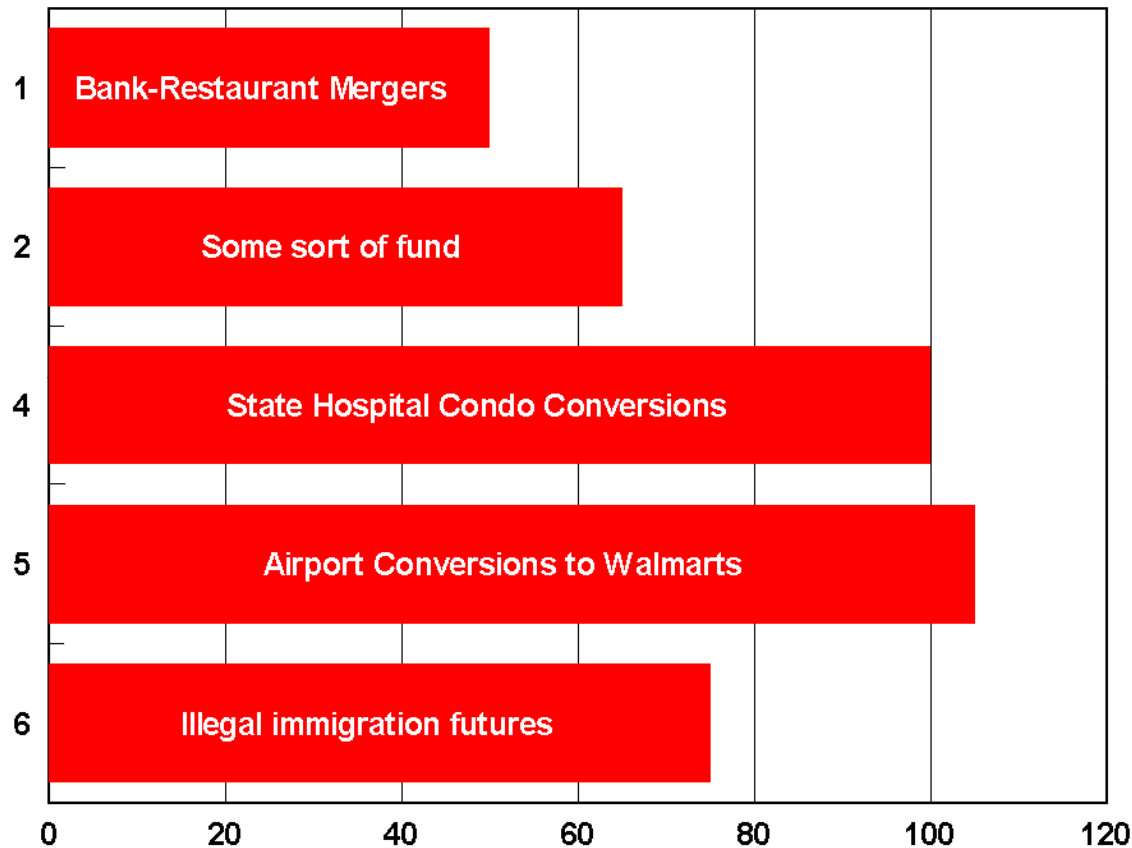
Source: www.Recovery.gov

ARRA's STATE AND LOCAL FISCAL RELIEF COMPONENT: \$144 BILLION

- ◆ **Enhanced Federal Medicaid funding for states**
- ◆ **States with higher unemployment rates get additional relief**
- ◆ **Supplemental funds to hospitals serving the indigent**
- ◆ **Moratorium on Bush's proposed Medicaid regulations to cut funding**
- ◆ **ARRA includes a Health Information Technology component**

THE NEXT BIG BUBBLE?: A NEW SURVEY

These are the economic bubbles Americans would like most to invest in to take their minds off the current toxic assets fiscal crisis.



Source: University of Chicago (just kidding)
(Adapted from "The Onion" by D. Braddock, 2008)

BANK-RESTAURANT MERGERS



New Yorker, 2008

FOR OUR RETIREMENT. LUXURY STATE HOSPITAL CONDO CONVERSIONS: DANVERS STATE HOSPITAL



**(Note the energy-saving boarded-up windows
and dedicated water tower.)**

“Legislators have never dealt with a recession as precipitous and rapid as this one,” said Susan K. Urahn, managing director of the Pew Center on the States. “They’re faced with some of the toughest decisions legislators ever have to make, for both political and economic reasons, so it’s not surprising that the environment has become very tense.” In all, states will face a [\$166 billion] budget gap in the coming year (2010), according to the National Conference of State Legislatures.

Abby Goodnough, “States turning to last resorts in budget crisis,” *New York Times*, 6/22/09, p. 1.

PROJECTED 2010 STATE BUDGET GAPS: RANKED BY PERCENT OF GENERAL FUND

State	Budget Gap (\$ Billion)	Percent of 2010 State General Fund
California	\$53.70	58.2%
Arizona	\$4.00	41.1%
Nevada	\$1.20	37.8%
Illinois	\$9.20	33.0%
New York	\$17.90	32.3%
Alaska	\$1.30	30.0%
New Jersey	\$8.80	29.9%
Vermont	\$0.28	24.8%
Washington	\$3.60	23.3%
Connecticut	\$4.10	23.2%
Wisconsin	\$3.20	23.2%
Florida	\$5.90	22.8%
Kansas	\$1.40	22.6%
Georgia	\$3.90	22.3%
North Carolina	\$4.60	21.9%
Louisiana	\$1.80	21.6%
Maine	\$0.64	21.4%
Minnesota	\$3.20	21.0%
Utah	\$1.00	19.8%
Rhode Island	\$0.59	19.2%
Hawaii	\$0.98	19.1%
Colorado	\$1.40	18.6%
Pennsylvania	\$4.80	18.0%
Massachusetts	\$5.00	17.9%
Delaware	\$0.56	17.6%

State	Budget Gap (\$ Billion)	Percent of 2010 State General Fund
Alabama	\$1.20	16.7%
Idaho	\$0.41	16.4%
New Hampshire	\$0.25	16.2%
Maryland	\$1.90	13.6%
Iowa	\$0.78	13.2%
District of Columbia	\$0.80	12.7%
South Carolina	\$0.73	12.5%
Ohio	\$3.30	12.3%
Michigan	\$2.40	12.0%
Kentucky	\$1.10	11.3%
Virginia	\$1.80	10.9%
Oklahoma	\$0.60	10.5%
Missouri	\$0.92	10.3%
Tennessee	\$1.00	9.7%
Mississippi	\$0.48	9.6%
TEXAS	\$3.50	9.5%
Indiana	\$1.10	7.5%
New Mexico	\$0.35	6.3%
West Virginia	\$0.20	5.3%
Nebraska	\$0.15	4.3%
Arkansas	\$0.15	3.2%
South Dakota	\$0.03	2.9%
Wyoming	\$0.03	1.7%
Oregon	Not Available	0.0%
TOTAL	\$165.90	24.4%

Source: McNichol & Lav, *Center on Budget and Policy Priorities*, June 29, 2009.

Note: Alaska and North Dakota have a budget surplus

TEXAS HAS ECONOMIC MOMENTUM (COMPARATIVELY)

INDEX OF ECONOMIC MOMENTUM ¹ IN THE TOP FIVE STATES: March '09		
U.S. RANK	STATE	INDEX
1	Alaska	3.61
2	North Dakota	2.56
3	Wyoming	2.27
4	Texas	1.90
5	Oklahoma	1.62
UNITED STATES		0.00

¹Index of economic momentum: Weighted average growth in personal income, employment and population (Federal Funds Information for States, March 2009).

Source: Braddock, D., Coleman Institute and Department of Psychiatry, University of Colorado, 2009.

U.S. RECESSIONS OF THE 20TH CENTURY

DATES	MONTHS
Sept. 1902 - Aug. 1904	23
May 1907 - June 1908	13
Jan. 1910 - Jan. 1912	24
Jan. 1913 - Dec. 1914	23
Aug. 1913 - March 1919	7
Jan. 1920 - July 1921	18
May 1923 - July 1924	14
Oct. 1926 - Nov. 1927	13
Aug. 1929 - March 1933	43
May 1937 - June 1938	13
Feb. 1945 - Oct. 1945	8
Nov. 1948 - Oct. 1949	11
July 1953 - May 1954	10
Aug. 1957 - April 1958	8
April 1960 - Feb. 1961	10
Dec. 1969 - Nov. 1970	11
Nov. 1973 - March 1975	16
Jan. 1980 - Nov. 1980	6
July 1981 - Nov. 1982	16
July 1990 - March 1991	8
March 2001 - Nov. 2001	8

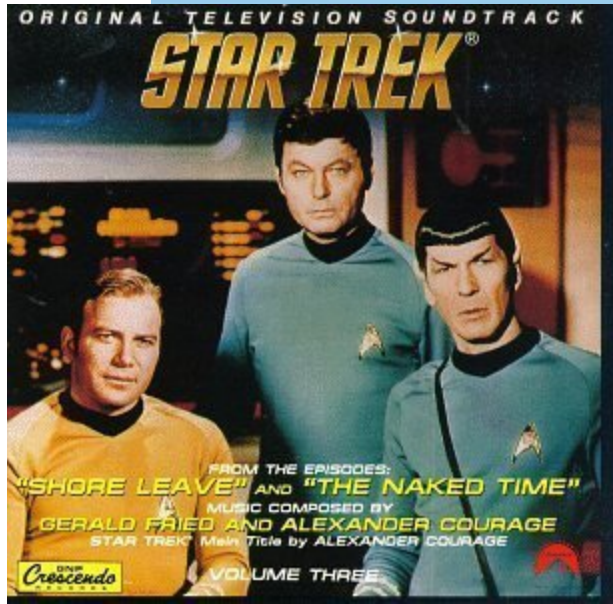
The current U.S. recession began December 2007

[19 months as of July 2009; only four were longer]

III. EMERGING TECHNOLOGIES IN I/DD RESIDENTIAL CARE AND PERSONAL SUPPORT

- 1. Innovations in technology***
- 2. Why use Technology in I/DD residential care?***
- 3. Characteristics of Smart Homes:
Night Owl Support Services
Rest Assured
Imagine! - Boulder***
- 4. Personal Support Technologies***

1. INNOVATIONS IN TECHNOLOGY: TECHNOLOGY WE EXPECTED



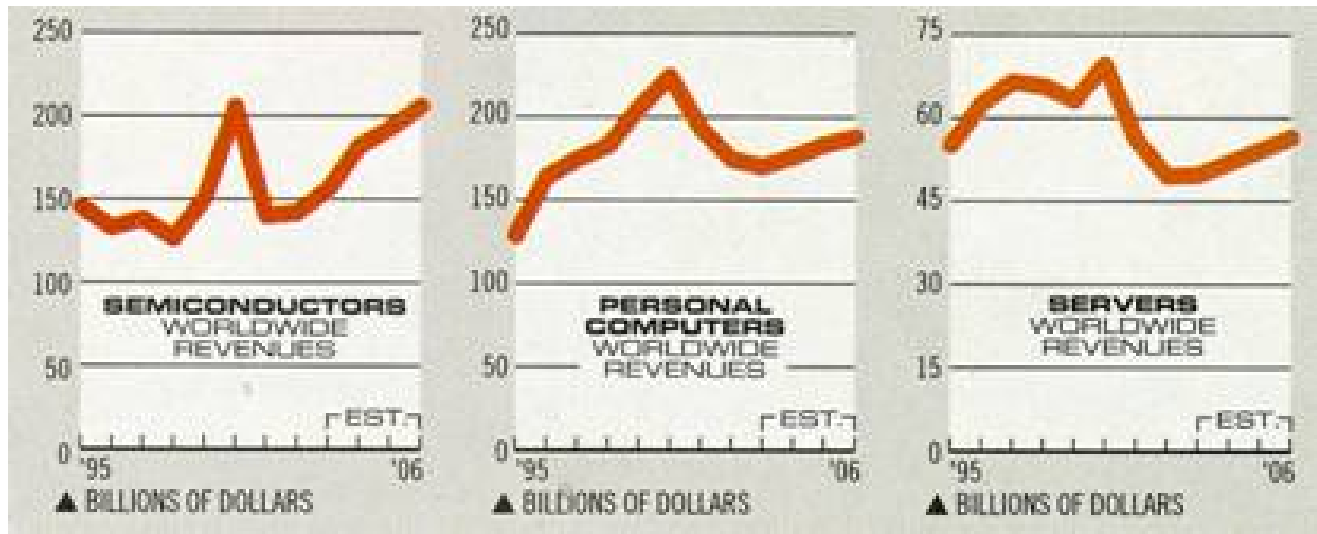
Source: Duane Tempel, Night Owl Support Systems, LLC (2009).

TOP 20 INNOVATIONS— LAST THIRTY YEARS

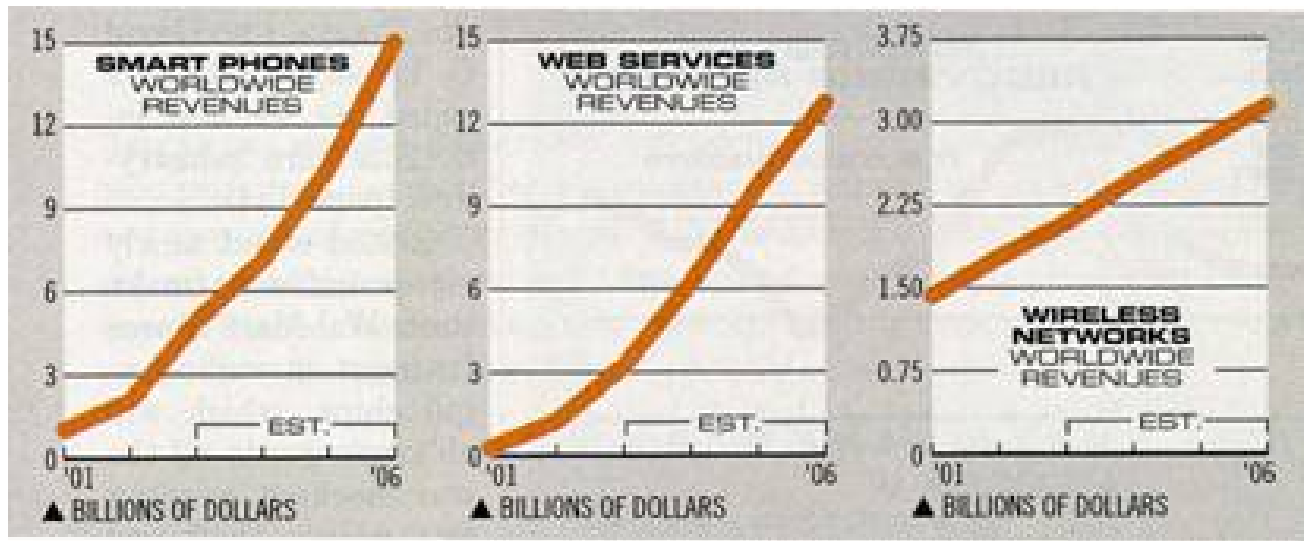
- 1. INTERNET BROADBAND**
- 2. PC AND LAPTOP COMPUTERS**
- 3. MOBILE PHONES**
- 4. E-MAIL**
- 5. DNA TESTING**
- 6. MRI**
- 7. MICROPROCESSORS**
- 8. FIBER OPTICS**
- 9. OFFICE SOFTWARE**
- 10. LASER/ROBOTIC SURGERY**
- 11. OPEN-SOURCE SOFTWARE**
- 12. LIGHT-EMITTING DIODES**
- 13. LIQUID CRYSTAL DISPLAY**
- 14. GPS DEVICES**
- 15. E-COMMERCE & AUCTIONS**
- 16. MEDIA FILE COMPRESSION**
- 17. MICROFINANCE**
- 18. PHOTOVOLTAIC SOLAR**
- 19. WIND TURBINES**
- 20. INTERNET SOCIAL NETWORKING**

Source: Wharton School of Business, University of Pennsylvania (*NY Times*, March 8, 2009, p. 2).

**AS SOME
MARKETS
MATURE...**



**NEW HIGH-
GROWTH
MARKETS
EMERGE...**



Sources: Adapted from *Business Week*, August 25, 2003.

THE ARC's PROPHECY: 21 YEARS AGO

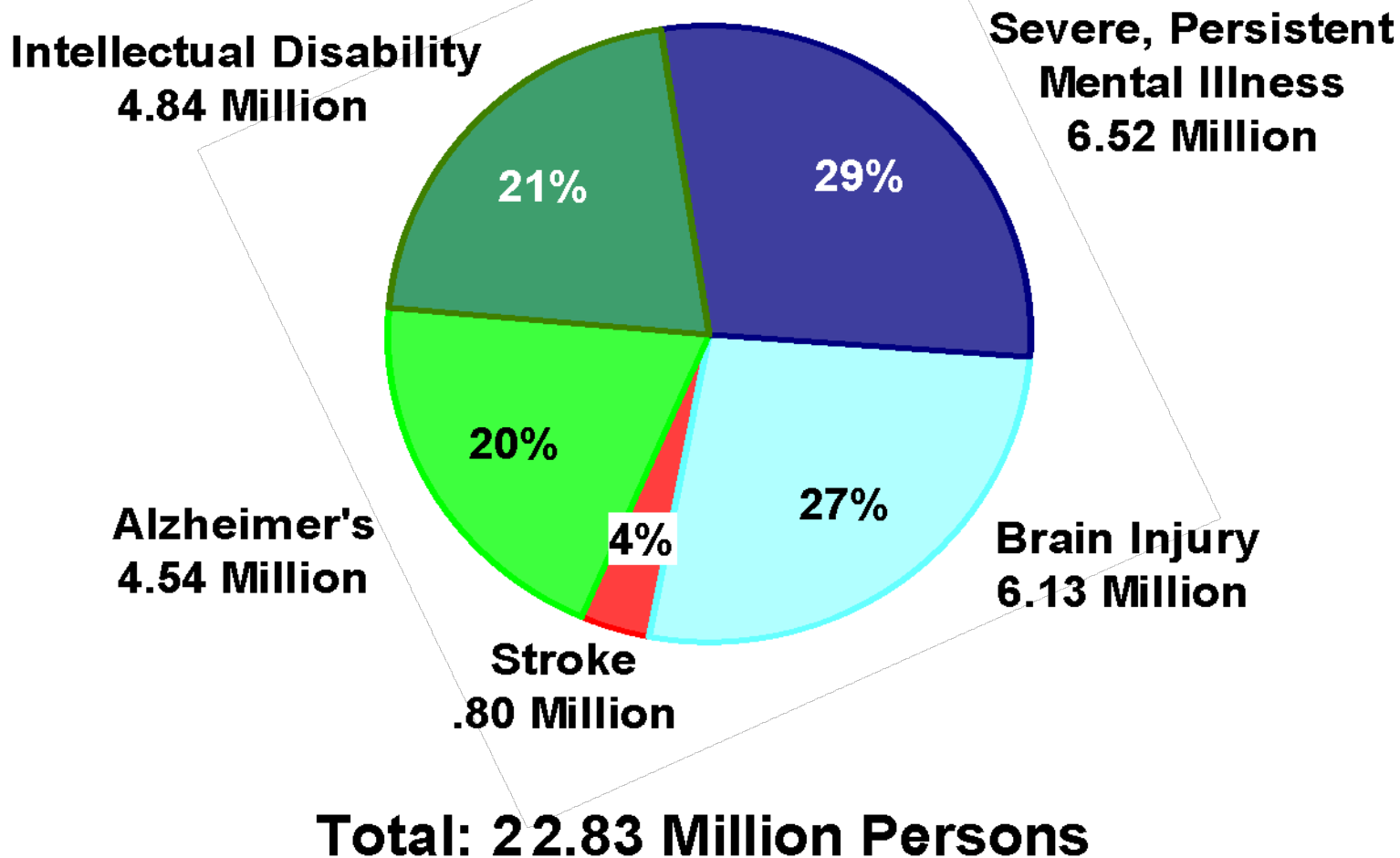
There is a prevailing belief ...in the field of assistive technology that people with mental retardation are not appropriate consumers of assistive technology... People with mental retardation should be named as a 'traditionally underrepresented group'...It is the belief of the Association for Retarded Citizens of the United States that advances [in AT] will not occur without strong leadership from our federal government (Cavalier, 1988)

Source: Testimony of A. Cavalier before the Senate Subcommittee on the Handicapped, 1988.

The Institute's mission is to catalyze and integrate advances in science, engineering and technology to promote the quality of life and independent living of people with **cognitive disabilities.**

www.ColemanInstitute.org

PREVALENCE OF COGNITIVE DISABILITY IN THE U.S., 2009



Source: D. Braddock. (2009). Boulder, CO: University of Colorado, Coleman Institute for Cognitive Disabilities.

- ◆ **Unemployment and poverty**
- ◆ **Stigma and discrimination**
- ◆ **Difficulty communicating**
- ◆ **Social isolation and emotional problems**
- ◆ **Lack of support for families**
- ◆ **Institutionalization**
- ◆ **A growing “Digital Divide”**

“I think we can do a ‘virtual nursing home’ with technology” ...

Andy Grove
Co-Founder, Intel Corp.
In *USA Today*, 2006

IF so, we can also provide individualized technology supports in multiple residential settings for people with developmental disabilities.

2. WHY USE TECHNOLOGY IN I/DD RESIDENTIAL CARE?

- **U.S. demand will grow from 533,000 persons currently in residential services – to nearly 700,000 persons in 10 years;**
- **Staff turnover in community living settings averages 50-70% nationally;**
- **Emerging residential technologies can address projected demand for long-term care services and reduce somewhat the need for tens of thousands of additional staff; and**
- **Technology can also monitor and support persons with I/DD in recreational, health promotion, and other activities of daily living.**

Source: D. Braddock, State of the Science Conference, Denver, 2006.

“We can alleviate some of the demand for Direct Support Professionals (DSPs) by identifying new service options for people who do not need intensive DSP support.

The Wabash Center developed one such alternative called ‘Rest Assured.’ This is a high tech system that allows two-way communication, and visual and sensor monitoring in a home. The system is tailored to the needs of each person who uses it and has been shown to improve personal independence, as well as alleviating the needs for a DSP where one is not needed.”

**Mitch Daniels, Governor, State of Indiana
The Arc of Indiana, *Meet the Candidates*, Summer 2008**

3. WHAT SMART HOMES CAN DO:

- 1. Provide a constantly monitored environment so the individual is safe (activity monitoring/remote sensing).**
- 2. Automate specific tasks that an individual is unable to perform (turning lights on or off).**
- 3. Provide a safe and secure environment (alerting the user of potentially dangerous activities).**
- 4. Alert caregivers should the occupant be in trouble (through linking to the local community alarm system).**
- 5. Enable and empower the user (by assisting them in daily tasks).**
- 6. Facilitate the rehabilitation of individuals (by giving prompts that could be auditory and/or visual).**

Source: Smart House Social Care, UK
(www.smarththinking.ukideas.com/Smarthoussocialcare.html)

4. U.S. SMART HOME SERVICE PROVIDERS FOR PERSONS WITH I/DD

**A. NIGHT OWL SUPPORT SYSTEMS, LLC.
MADISON, WISCONSIN**

**B. REST ASSURED, LLC.
LAFAYETTE, INDIANA**

**C. IMAGINE!,
BOULDER, COLORADO**

A. NIGHT OWL SUPPORT SYSTEMS

- **Currently (10/2/08) supports 193 persons with ID/DD and 130 residences with planned expansion into other states (e.g., IL, IN, TX, VT)**
- **Central monitoring site in Dane County, WI (Madison area)**
- **Provides offsite nighttime monitoring with direct staff intervention/support (only if necessary), 3-5 min. response time**
- **Less staff intensive, less costly, and less intrusive than having ongoing overnight staffing**

Monitoring Station



- **Professional Monitors**
- **Communication between Monitor and staff/ individuals served**
- **Access to protocols and personal intervention strategies**
- **Provider agency back-up**
- **Individualized alarm readings**
- **Generates reports**

- Personal Pagers
- Door/Window Security Sensors
- Smoke Detectors
- Carbon Monoxide Detectors
- Flood/Moisture Sensors
- Motion/Sound Sensors
- Stove Sensors
- Incontinent Detectors
- Other Sensors Available Upon Request

- Completely Wireless in the Home
- Cellular Transmission- No Phone or Internet Connection is Required
- X-10 Communication Technology
- 2-Way Communication
- Event Sequencing
- Data Tracking
- Portable and Adaptable to People's Homes and Abilities

**Night Owl Costs average between
\$25 to \$850 per person per month**



Consumer with Lifeline pager on his wrist

Source: Night Owl Support Systems, LLC, Madison, Wisconsin

B. SMART HOMES: INDIANA'S REST ASSURED PROGRAM



Staff person monitors several apartments simultaneously.



Pan-tilt-zoom monitoring cameras located above entryway and looking into living space.

Source: Jeff Darling, Executive Director, Rest Assured, LLC.

- **Wabash Center: in collaboration with EPICS (Engineering Projects In Community Service) at Purdue University and ResCare**
- **Serves consumers with I/DD**
- **52 apartments with 118 consumers served (as of 10/4/08)**
- **Uses PTZ (Pan, Tilt, Zoom) cameras for monitoring in high risk areas like the kitchen**
- **Uses motion, temperature, carbon monoxide and door brake sensors, and a Personal Emergency Response System**

Source: Jeff Darling, Executive Director, Rest Assured, LLC.

- **Remote supervision via two-way audio/video communication with caregiver**
- **Consumers report increased independence since caregiver is not a constant physical presence**
- **Reduced overall cost of care**
- **Used for third-shift support**
- **Need to gain Medicaid approval for reimbursement of technology support**

- **Website: <http://www.restassuredsystem.com/>**

Source: Jeff Darling, Executive Director, Rest Assured, LLC.

C. IMAGINE! SMART HOME, COLORADO: OPENED JULY 2009



Imagine! Smart Homes, Boulder and Longmont, Colorado
<http://www.imaginesmarthomes.org/>

IMAGINE! SMART HOME, BOULDER, COLORADO: DEVELOPMENT STAGES

2005: Imagine! visits smart home projects in Oregon, Indiana and Florida, and works with the University of Colorado's Coleman Institute for Cognitive Disabilities

2006-2008: City of Boulder provides a \$400,000 grant for launching the Smart Home; City of Longmont follows with grant for second home

2008: Bob and Judy Charles and other donors pledge over \$100,000 toward development of the Smart Home

September 2008: Groundbreaking

July 2009: Smart Home completion in Boulder

INTEGRATION OF SEVERAL TECHNOLOGIES TO HELP SUPPORT PEOPLE WITH DISABILITIES

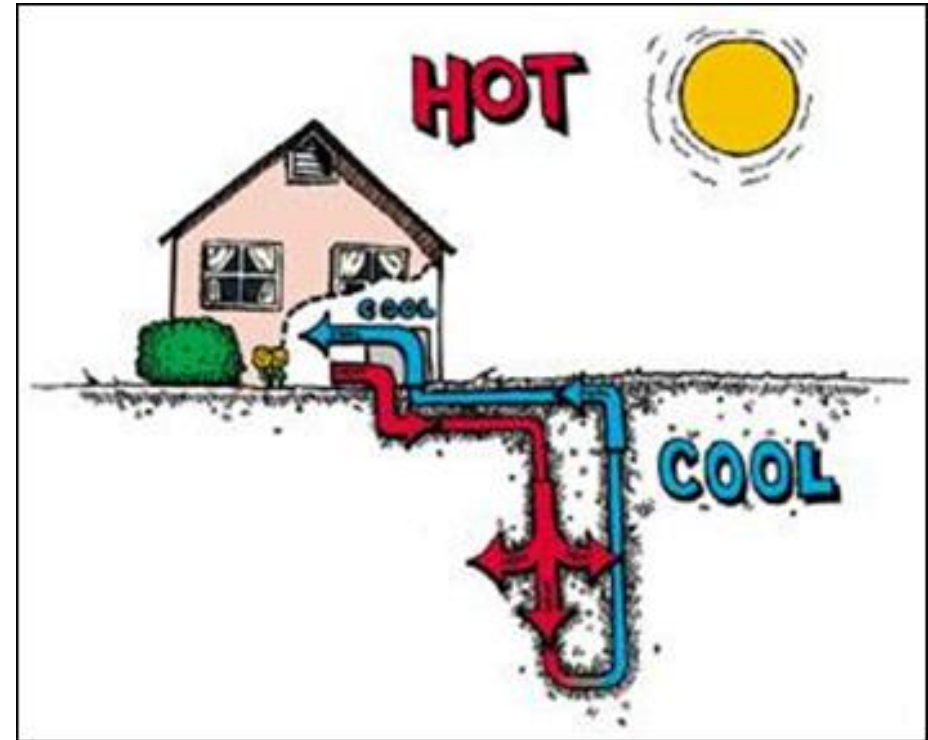
- **Green technologies**
- **Systems to create staff efficiencies**
- **Systems to provide managers better decision making information**
- **Consumer environmental and communication adaptations**
- **Information portal for families**

- **ELITE CARE™/Curotek provides the web-based system for real-time resident monitoring, alerts, reporting, and care planning.**
- **Activity and safety sensors are utilized: bio-metric, motion, pressure, contact, security, fire, temp, nurse call, door threshold**
- **Residents' badges provide location, call for assistance**



IMAGINE! SMART HOME, BOULDER, COLORADO: GREEN TECHNOLOGIES

**Photovoltaic cells
generate electricity**



**Geothermal systems heat
and cool the home**

CONSUMER ENVIRONMENTAL AND COMMUNICATIONS ADAPTATIONS

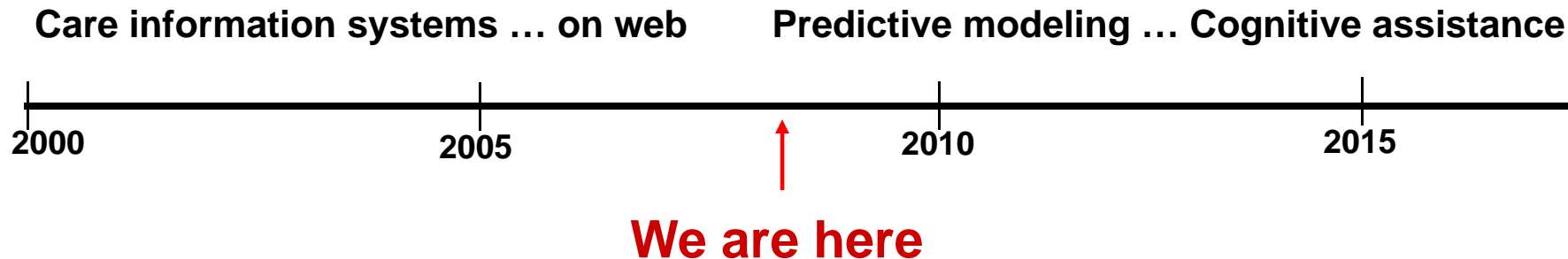
- **Accessible control of environment and appliances**
- **Accessible, safe kitchen and bathroom**
- **Cameras monitor high-risk areas**
- **Automated windows and doors**
- **Task prompters and reminders**
- **Specialized, accessible PC, Internet, journaling and web conferencing**

- **Allows family to monitor care of relative**
 - **Daily activities**
 - **Environmental conditions**
 - **Health status**
- **Facilitates communication via file and picture sharing**

- 1. Lifelogging – document/disseminate consumers' life histories**
- 2. Two-way AudioVisual communication**
- 3. Hands-free communication and paging devices**



- **Employee portal for centralized information collection and reporting**
- **Imagine!'s web-based medication prompting system (MedSupport)**
 - **Greg Wellems developed**
- **Location based activity prompting and logging**
- **Web based training courses**



RECOMMENDATIONS:

- **Adopt early: learn from experience**
- **Start small: expand incrementally**
- **Adopt gradually: change care procedures**
- **Assess needs, cost-benefits, & risk**
- **Plan pilot & evaluation with R&D partner**

○ *Source: Rodney Bell, Coleman Institute consultant (2007)*

Visual Assistant (Prompting System)



Source: Ablelink Technologies, Colorado Springs (Terry & Jonathan).

Visual Assistant

- ❑ A pocket personal computer with an integrated PC-slot digital camera;
- ❑ Staff/caretakers take pictures of—and narrate—the steps in a task;



- ❑ The verbal instructions and images guide users through the steps:
 - Grocery shopping
 - Medications
 - Personal hygiene
 - Using public transportation, etc.

SOURCE: Ablelink Technologies, Colorado Springs.

Adapted Web Browsers & Email Programs



Web Trek's
Favorite
Sites

The Web Trek adapted web browser improves access to the World Wide Web for people who have difficulty with reading and writing.

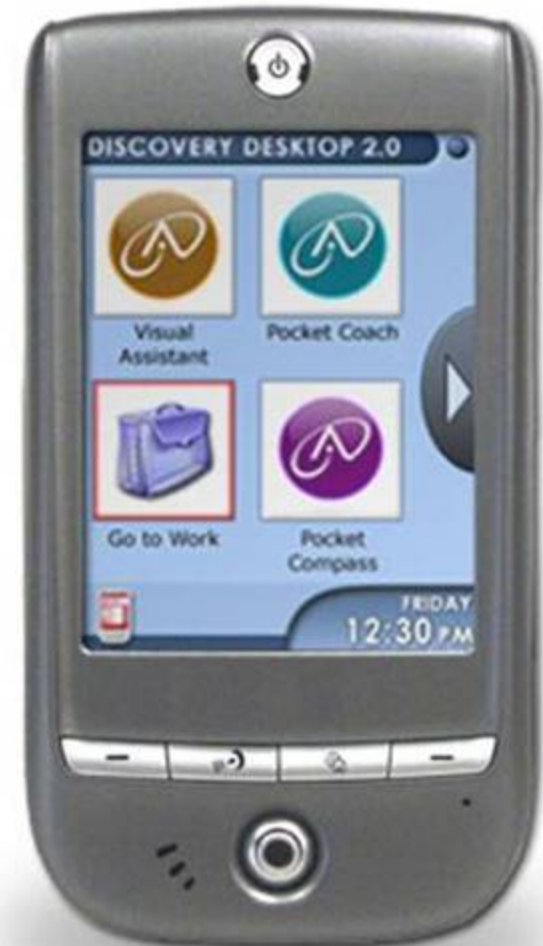


Web Trek
Connect's
picture-based
Inbox and
interface for
automated
recording and
sending of
audio email.

SOURCE: Ablelink Technologies, Colorado Springs.

AbleLink's Pocket Discovery Desktop sits "on top" of the traditional Windows Pocket PC desktop and provides a simplified interface for accessing programs.

On screen buttons, complete with pictures and audio messages, help users identify different programs.



Source: Ablelink Technologies, Colorado Springs; www.ablelinktech.com

Rocket Reader Audio Books for People with Cognitive Disabilities



Source: Ablelink Technologies, Colorado Springs; www.ablelinktech.com

- Nextel mobile locator:

http://www.nextel.com/en/services/gps/mobile_locator

- Wherifone:

<http://www.wherify.com/wherifone/>

- Accutracking:

<http://www.accutracking.com/>

- 911 to go:

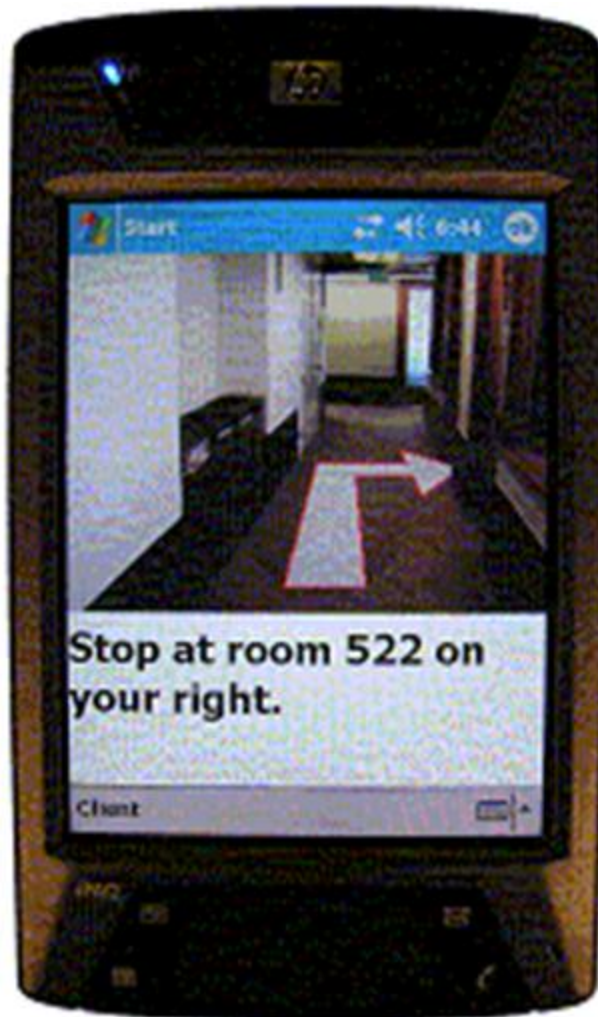
http://911togo.com/rf_child_tracking/child-locator.html

- Contact your cell phone provider for phones/services



INDOOR WAYFINDING

Participants preferred images with arrows, not audio alone



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AUTISM THERAPY ROBOTS

**Socially Assistive Robots, Univ. of Southern California Interaction Laboratory.
Children with Autism Spectrum Disorder interact more easily with mechanical devices than with humans?**



Source: Interaction Laboratory - Professor Maja Matarić, USC Engineering, 2009