

## *History of Communications Industry*

- ▶ Telecommunications Timeline
- ▶ Divestiture
- ▶ Local Access and Transport Area
- ▶ Independent Telephone Companies

## **Telecommunications Timeline**

- 1830's** Germany erected a telegraphy network spanning 8,000 feet. Georg Ohm developed the Ohm's law for defining electron flow through a conductor. Samuel F.B. Morse invents the telegraph (1837).
- 1840's** US Congress spent \$30,000 for a telegraph line running from Washington to Baltimore. Samuel F.B. Morse commercializes a telegraph device and establishes Western Union Telegraph Company (1845, 1856).
- 1850's** European telegraph wires and underwater cables are already in use.

## **Telecommunications Timeline** *(Continued...)*

- 1861-1865** American Civil War - US telegraph industry sent 6,000,000 messages across 200,000 miles of line using 1,500 operators.
- 1866** Transatlantic telegraph cable was completed.
- 1870's** The Depression
- 1876** *March* - Elisha Gray and Alexander Graham Bell's father-in-law independently file for patent of the telephone.  
*June* - Bell is recognized as the inventor of the telephone over Elisha Gray in a split US Supreme Court decision. Also the month of Custer's Last Stand.

## *Telecommunications Timeline* *(Continued...)*

- 1877** The Bell Telephone Company was formed to provide telephone service. Bell offers to sell the entire Bell Telephone Company to Western Union for \$100,000, but is turned down.
- 1878** Western Union opened the first crude switchboard in New Haven, CT. Western Union connected 30,000 telephones in less than one year. Bell Company sues Western Union for patent infringement.

## *Telecommunications Timeline* *(Continued...)*

- 1879** President Rutherford B. Hayes installs the first White House phone. Western Union gives up the patent suit. Bell Telephone stock rises from \$300 to \$1000/share overnight.
- 1880** Company renamed American Bell Company (installed over 230,000 instruments)
- 1882** Bell Telephone Co. buys Western Electric
- 1883** Bell Laboratory was formed.
- 1885** A subsidiary named AT&T (American Telephone & Telegraph) is formed and charged with the sole task of building and operating long distance service.

## *Telecommunications Timeline* *(Continued...)*

- 1891** First Automatic Switching Machine was patented
- 1893** Original Bell patent expired: opened the door to independent phone companies (about 4,500)
- 1896** First dial telephone installed
- 1899** AT&T becomes parent of the Bell System
- 1901** One millionth telephone installed by the Bell system

*Telecommunications Timeline*  
(Continued...)

**Mann-Elkins Act of 1910**  
Placed the Interstate Commerce Commission (ICC) in charge of regulating the "Communications" industry.

**Kingsbury Commitment of 1913**  
To avoid a federal antitrust lawsuit, AT&T VP Nathan Kingsbury promises that AT&T will not buy any more "Independents" w/o DOJ approval. Also lets Independents connect to the AT&T network. Finally, AT&T agrees to sell its interest in Western Union.

**Graham Act of 1921**  
Exempts AT&T from the Sherman Antitrust Act of 1890

**Communications Act of 1934**  
Establishes the Federal Communications Commission (FCC)

*Extending Services to Rural America*

- Rural Electrification Act of 1936
  - Rural areas are not profitable for the utility companies. But Congress wants all of America to benefit from this "modernization". This act made low-cost, government-backed loans available to entrepreneurs willing to establish electrical services to rural areas. It is expanded in 1949 to include telephone services. How does the government pay for these "loans"? A tax on existing subscribers is established. A "universal service" fee.

*Telecommunications Timeline*  
(Continued...)

**1934** The FCC (Federal Communications Commission) relieved the ICC (Interstate Commerce Commission) of its regulatory role in telecommunications. They were established to regulate Interstate communications. The PUC/PSC Public Utilities/Service Company regulates Intrastate communication. In order to obtain permission to offer service, a tariff must be filed with the appropriate regulatory agency.

**1949** The DOJ (Department of Justice) brought suit against AT&T for violations of the Sherman Anti-trust Act. Included in this suit was the goal of divesting AT&T's manufacturing subsidiary, Western Electric.

*Telecommunications Timeline*  
(Continued...)

**1956** The suit was settled with the Consent Decree (details in text)

**1968** The Carterfone decision opened the door to competition in telephone equipment, and made possible new companies called Interconnects.

**1969** MCI (Microwave Communications Incorporation) built a microwave transmission system between Chicago, IL and St. Louis, MO.

**1974** The DOJ (Department of Justice) filed a complaint that accused AT&T of abusing its monopoly.

*Telecommunications Timeline*  
(Continued...)

**1981** The FCC allowed unlimited resale of all interstate telephone service. The anti-trust trial against AT&T begins with Judge Harold H. Green presiding.

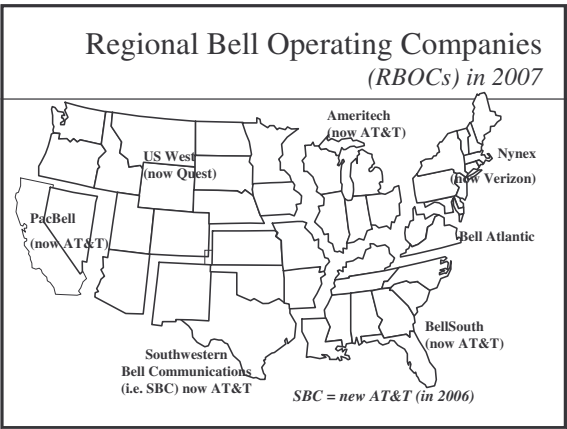
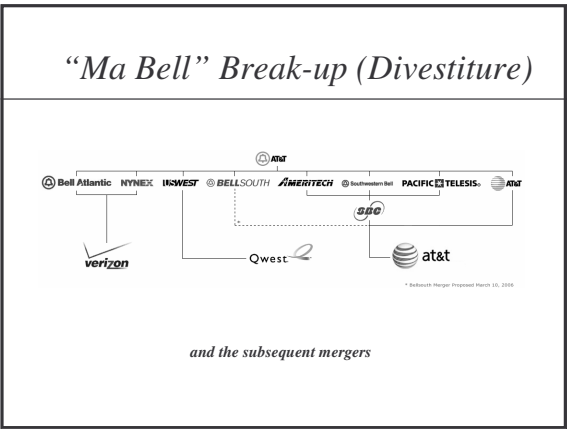
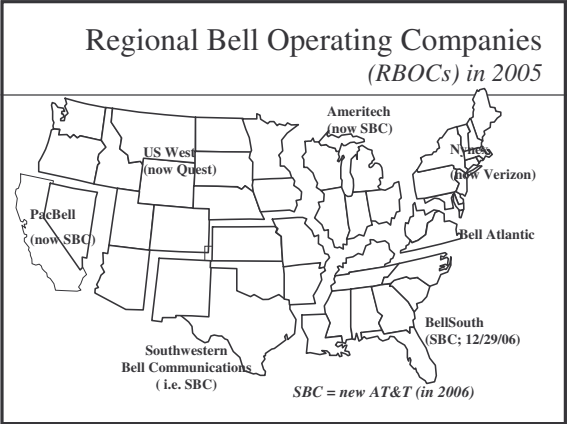
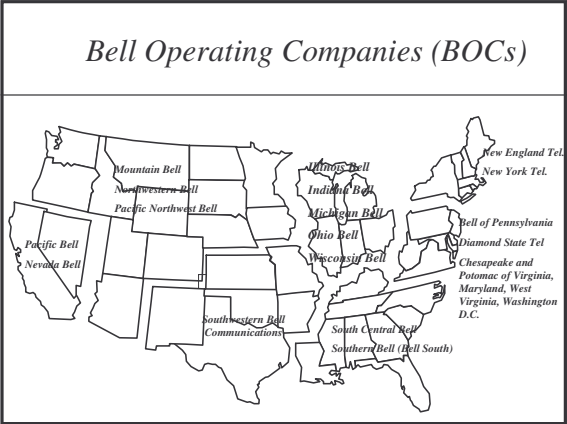
**1982** The Department of Justice and AT&T reach a settlement in return for significant modification of the 1956 Consent Decree. The settlement would completely separate all local and long distance operations. Judge Greene signs a MFJ (Modified Final Judgement)

**1984** The divestiture plan filed by AT&T calls for the 23 Bell Operating Companies (BOC's) to be divested effective 1-1-84 and restructured into 7 Regional Bell Operating Companies (RBOC's; the so called "Baby Bells").

**1996** Telecommunications Reform Act (more to follow).

*Modified Final Judgment of 1984*  
Bell System after 1-1-1984

|  |   |
|--|---|
| <p><b>AT&amp;T</b></p> <ul style="list-style-type: none"> <li>‣ Long Lines (long distance &amp; International Calling)</li> <li>‣ Western Electric (Equipment Manufacturer)</li> <li>‣ Bell Telephone Labs (Bell Labs)</li> <li>‣ Embedded Base</li> <li>‣ Get into the Computer Market</li> </ul> | <p><b>7 RBOCs/ ILECs</b></p> <ul style="list-style-type: none"> <li>‣ Local Service</li> <li>‣ Bell Symbol</li> <li>‣ Yellow Pages</li> <li>‣ Directory Assistance</li> <li>‣ Created Bellcore (3-9-99 Telcordia )</li> </ul> |
|--|---|



### Local Access and Transport Area (LATA)

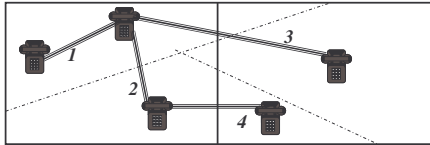
- ▶ Created as a result of Divestiture.
  - ▶ Modified Final Judgment of 1984
- ▶ A LATA may cross a state line. LATA's are not related to area codes, but often are associated with area codes.
- ▶ A LATA is a geographical area in which the LEC (Local Exchange Carrier) is allowed to carry local and local toll calls.

### Local Access and Transport Area (LATA)

- ▶ Calls originating and terminating within the same LATA are called IntraLATA calls. These calls are handled by the LEC.
- ▶ Calls originating in one LATA and terminating in another LATA are called InterLATA calls. These calls are handled by the IXC or IEC (Interexchange Carrier).
- ▶ The LEC may use other names such as calling areas or calling zones when referring to LATA's.
- ▶ Incumbent Local Exchange Carriers (ILECs) were granted LATA territories and still enjoyed monopolies within those areas for local phone services.

## Local Access and Transport Area (LATA)

Label each diagram as IntraLATA or InterLATA, IntraState or InterState and who would handle each call? IXC or LEC call?



1. IntraLATA, Intrastate, LEC, PUC/PSC State \_\_\_\_\_  
 2. InterLATA, Intrastate, IXC, PUC/PSC LATA \_\_\_\_\_  
 3. InterLATA, Interstate, IXC, FCC \_\_\_\_\_  
 4. IntraLATA, Interstate, LEC, FCC \_\_\_\_\_

## Independent Telephone Companies

- Bell's original telephone patent expired and by the early 1900's over 9,000 Independent companies were formed. The number increased to about 14,000 by early 1980s.
  - There are approximately 1,400 Independents (early 2000)
  - Not Affiliated with AT&T or Bell.
  - Not directly restricted by Divestiture.
  - May provide whatever service they want within Regulatory approval. Who Are They?
- ▶ AOL, Bixby Telephone, Chouteau Telephone, Cimarron Telephone, Dial Tone Savers, Excel Communication, Frontier, GTE, LCI, LOGIX, WorldCom, Sprint, US Long Distance, Westel Inc, Williams Communications, 1-800-RECONEX, etc.....

## Telecommunications Reform Act of 1996

- ▶ On February 6, 1996 Congress passed the Telecommunications Reform Act of 1996. Among other things, the Act allows local and long distance carriers to enter each other's territories.
- ▶ RBOCs (ILECs) can offer long distance once the FCC, Attorneys General and PUC/PSC determines that it has opened it's local market to competition by other telecommunications companies (CLECs).
- ▶ Long distance carriers with less than 5% of the U.S. market share are allowed to bundle local and long distance service right away. Larger carriers need approval.
- ▶ Strikes down Computer Inquiry II ruling that disallowed LECs to sell or lease station equipment. They can spin off subsidiaries to sell key-systems and PBXs to businesses

## Telecommunications Act of 1996

- Allocates broadcast spectrum to licensed broadcasters for HDTV (SDTV okay for 10 yrs)
- Requires LECs to lower their access fees to IECs
- Allows AT&T to re-enter local telecom market
- Institutes the V-chip for parental control of TV
- Asks LECs to provide "universal service" to all customers at same rate as charged in large cities

## Telecommunications Act of 1996 (continued....)

- ▶ Though change in the industry will be widespread, calls will still be processed in virtually the same manner.
- ▶ The New Players are...
  - ⇒ AT&T & Bell Companies
  - ⇒ Independents
  - ⇒ ISP (Internet Service Providers)
  - ⇒ Cable & Entertainment Companies
  - ⇒ Utilities (Gas, electric)

## The Checklist

- RBOCs must complete a 14 point check list and provide the following services to competitors:
  - Equal Access
  - Reasonable Rates for Resale
  - Co-location Right of Way
  - Number Portability
  - Directory Assistance and 911 Access
  - Local Loop and Switching Services

### *Interconnection*

- ILECs must supply the following to all CLECs.
  - Incumbent Local Exchange Carriers & their Competitors.
  - Resale Capability
  - Number Portability
  - Dialing Parity
  - Access to rights-of-way, including poles.
  - Reciprocal compensation
  - Unbundled Access
  - Co-location

### *Resale Capability*

- All telecommunications services it supplies to its retail customers should be available to competitive carriers.
  - *The wholesale price for resale of call transport and termination of calls must be at cost. No provisions of profit for ILECs are built into this ruling.*
- CLECs are hoping for high enough discounts on the price of transport, switching and terminating services to enable them to earn a profit on resale.

### *Local Number Portability*

- Allows customers to keep their telephone numbers (TN) if they change vendors.
- TN are assigned by the LEC in blocks of 1,000.
- December 1998 - LECs required to provide LNP in the 100 largest SMSAs.
  - LECs must make portability available 6 months after receiving request from another carrier
- June 30, 1999 - Wireless LNP is mandated.

### *LNP*

- Service Provider Portability
  - an end-user's ability to keep the TN when changing carriers.
- Location Portability
  - keep TN when moving.
- Service Portability
  - keep TN when changing from wireline to wireless or voice to data services.
- One Number for Life Portability
  - keep TN regardless of location or service used.

### *Dialing Parity*

- Equal access such that customers can access their vendors without dialing extra digits.
- Access to operator services, directory assistance and directory listing with no unreasonable dialing delays.
  - 1010ATT00, 10109000
  - Feature groups A, B, C, and D (see textbook, p.38)

### *Access to Rights-of Ways*

- Utilities must provide non-discriminatory rates to cable TV companies and CLECs.
- Must allow non-discriminatory access at equitable rates to their ducts (conduits) and rights-of-way.
- If a utility uses its own poles, ducts and rights-of-way to provide telecommunications services, it must charge its own entity the same rate it charges other carriers.

### *Reciprocal Compensation*

- Telecommunications carriers must establish reciprocal compensation arrangements for the transport and termination of each others' calls.

### *Unbundled Access*

- ILECs are required to provide unbundled network elements such that CLECs can combine these elements to provide telecommunications services.
  - They must also show exactly how much each component of local service costs.
- CLECs should be able to buy only the pieces of the Bells' network services that they need to provide local telephone service.

### *Co-Location*

- The ILEC should allow physical co-location of competitive equipment at the ILECs premise for access to the unbundled network features.

### *Additional Key Points*

- Universal Service
  - People in rural, insular and high-cost-to-reach areas, as well as poor consumers, should have access to telecommunications services at reasonably comparable rates for similar services in urban areas. This provision applies to schools, health care providers and libraries.
- Prohibitions Against Slamming
  - Forbids any carrier from submitting or changing a subscriber's carrier without their authorization.

### *TC Reform Act of 1996 also controls*

- Broadcasting Obscenity and Violence
- Video Programming Services
- Cable Services - Deregulation of Rates
- Broadcast Services - Relaxed Rules
- Electronic Publishing by RBOCs