Non-Ductile Concrete Buildings

- How Many in LA City?
- Complexity of Task
- Preliminary Methods Used by LA City
- NEES – Grand Challenge
- Additional Work Needed
Complexity of Task

- Challenges for City of Los Angeles
  - Large area ~ 460 sq miles
  - Large population ~ 3.8 million
  - Over 800,000 parcels of land
  - ~ 2.3 million buildings
  - Records and information not readily available – exists in hand generated records from various sources.
  - Excludes surrounding cities
Preliminary Methods Used by LA City

• Past Ordinances
  – Parapet Walls
  – URM Buildings
  – Steel Frame Buildings (San Fernando Valley)
  – SB 547 – Infill wall building inventory
  – Post-Northridge
    • City of LA/SEASOCS Engineering Task Groups
    • Struct Damage Assessment
    • Query of LA Co Tax Assessors Raw Data
NEES – Grand Challenge

• NSF Funded Project - “mitigate collapse risk of older nonductile concrete buildings during earthquakes.”
  – Major Components
    • Inventory of nonductile conc buildings
    • Estimate Collapse Risk (using current tools & best available ground motions)
    • Improve Risk Assessment Tools
    • Reassess Collapse Risk w/ improved tools
• LA City selected by PEER for development of nonductile conc bldg inventory.
• Work described in paper given at 14th WCEE event in Beijing, Oct, 2008.
DATA SOURCES

• LA County Tax Assessor (limited mostly to privately owned properties)
• Publicly available databases
  – ZIMAS (Zone Information and Maps Access System)
  – LUPAMS (Land Use Planning and Management System)
  – Adaptive Reuse project
• Sanborn maps (fire insurance maps up to the 50’s)
• AB 300 database of schools (CA Seismic Safety Commission)
• State-owned buildings (Dept. of General Services)
• Public universities (CSU Chancellor & UC Office of Pres.)
• Hospitals (OSHPD)
• Harbor facilities (Port of LA)
• Building plans (LA Building & Safety, visits to engineers)
• Visual Data Confirmation (Sidewalk surveys, Google Streetview, Live Search, Sanborn maps)
Problems with the Assessor data

- Each address is linked to an APN (Assessor Parcel number) and corresponds to 1 line of data
- A given address can be linked to multiple APNs (different taxable entities)
- Fields not always correctly populated, especially for non-taxable properties (square footage, number of stories, year built, etc.)
- Each line of data contains up to 5 entries
  - More buildings could exist
  - Difficult to know which building is which
  - Some entries are not “buildings”
- Multiple lines can correspond to the same parcel (Condominiums)
- Assessor data is a only a starting point and each line much be checked systematically
Data Collected

• Location
• “Quality class” (construction type – concrete frame Vs wood frame)
• Year built (pre-1976 as target)
• Number of stories
• Square footage
• Occupancy (main one)
• Apparent potential deficiencies (tall first story, visible damage – sidewalk survey only)
Summary
Preliminary

- Final list is 1527 lines (1 per building/entry)
- 73 entries still have missing data
- 1454 entries were finalized
- 1316 buildings are complete (138 addresses correspond to parking/vacant lots)

- Bottom line number of:
  \(~1300 + 250\) hospitals
  +250 schools
  \(= \sim1800\)

(Does not include retrofitted buildings)
LA City: NDC Buildings - Year Built

Year Built

Number of Buildings


0 50 100 150 200 250 300 350 400 450 500
LA City: NDC Buildings - No. of Stories

Number of Stories

Number of Buildings

Number of Stories

1 2 3 4 5 6 7 8 9 10 11 12 13 14 and higher
LA City: NDC Buildings – Usage Summary (finalized buildings)

- Education
- Hospital
- Church/ Theatre
- Hotel
- Recreation
- Industrial, Manufacturing, Warehousing
- Offices / professional services
- Residential
- Parking structure
- Vacant
- Commercial/restaurant
- Offices / professional services
LA City: NDC Building Inventory
Additional Work

- ~ 250 School Buildings
  - Public Schools, Community Colleges, California Universities

- ~ 250 Hospital Buildings
  - OSHPD Hospitals

! Missed Buildings !