

Federal Building and Fire Safety Investigation
of the World Trade Center Disaster

Visual Data Collection and Analysis

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Visual Collection and Time Line Development for WTC 1, 2, and 7

Purpose: To utilize photographs, videos, and other relevant information to develop detailed time lines for the spread and growth of fires at the peripheries of World Trade Center Buildings 1, 2, and 7 and to organize the information such that it can be utilized by other investigation team members.

TEAM MEMBERS

Leader: Bill Pitts

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Other Important Contributors:

Doug Walton Ron Rehm
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TOPICS

- Collection and Data Basing Status
- Fire Analysis Status
- Response of WTC 2 to Plane Strike
- Contributions to Other Investigation Projects

Status of Visual Material Collection and Data Basing

- Immense amount of material collected and timed.
 - 6,900 photographs catalogued (in excess of 185 photographers represented) with 3,060 timed with accuracy of 3 seconds or better.
 - Approximately 150 hour of videotape digitized and clipped (6,882 clips) from more than twenty individuals, news organizations, and documentaries with 2,674 clips timed with accuracy of 3 seconds or better.
- NIST is no longer actively seeking new visual material.
- NIST believes that the visual material in its possession is sufficient for the purposes of the Investigation.

Status of Fire Analysis for WTC 1, 2, and 7

- Time lines for window openings, smoke, and fire have been completed for WTC 1 and WTC 2
- Visual material for WTC 7 is insufficient to develop a detailed time line, but it does provide an adequate description of fire movement and location up to collapse
- Fires in WTC 7 are observed on floors 7, 8, 9, 11, 12, 13, 22, 29 and 30 with rapid spread in the late afternoon
- Analysis of WTC 7 fires is continuing

KEY FOR TEST ANALYSIS

Sheet #1: Fire Visible

- | | | | |
|---|---------------------|---|------------------|
| 0 | No fire | 3 | External flaming |
| 1 | Spot fire | 9 | Not visible |
| 2 | Fire visible inside | | |

Sheet #2: Smoke

- | | | | |
|---|------------------|---|---------------|
| 0 | No smoke evident | 2 | “Heavy smoke” |
| 1 | “Light smoke” | 9 | Not visible |

Sheet #3: Windows

- | | |
|---|-----------------|
| 0 | Window open |
| 1 | Window in place |
| 9 | Not visible |

| | A | AB | AC | AD | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | | 233 | 232 | 231 | 230 | 229 | 228 | 227 | 226 | 225 | 224 | 223 | 222 | 221 | 220 |
| 2 | 110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 109 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 108 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 107 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 106 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 104 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 103 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 102 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | 101 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 99 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 |
| 14 | 98 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 |
| 15 | 97 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 3 | 3 | 0 | 0 | 0 |
| 16 | 96 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | 94 | 0 | 0 | 0 | 2 | 2 | 3 | 3 | 3 | 3 | 0 | 2 | 0 | 0 | 3 |
| 19 | 93 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | 91 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | 89 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | |
| 31 | | | | | | | | | | | | | | | |
| 32 | | | | | | | | | | | | | | | |
| 33 | | | | | | | | | | | | | | | |
| 34 | | | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | | | |

WTC 1

106 out of 208

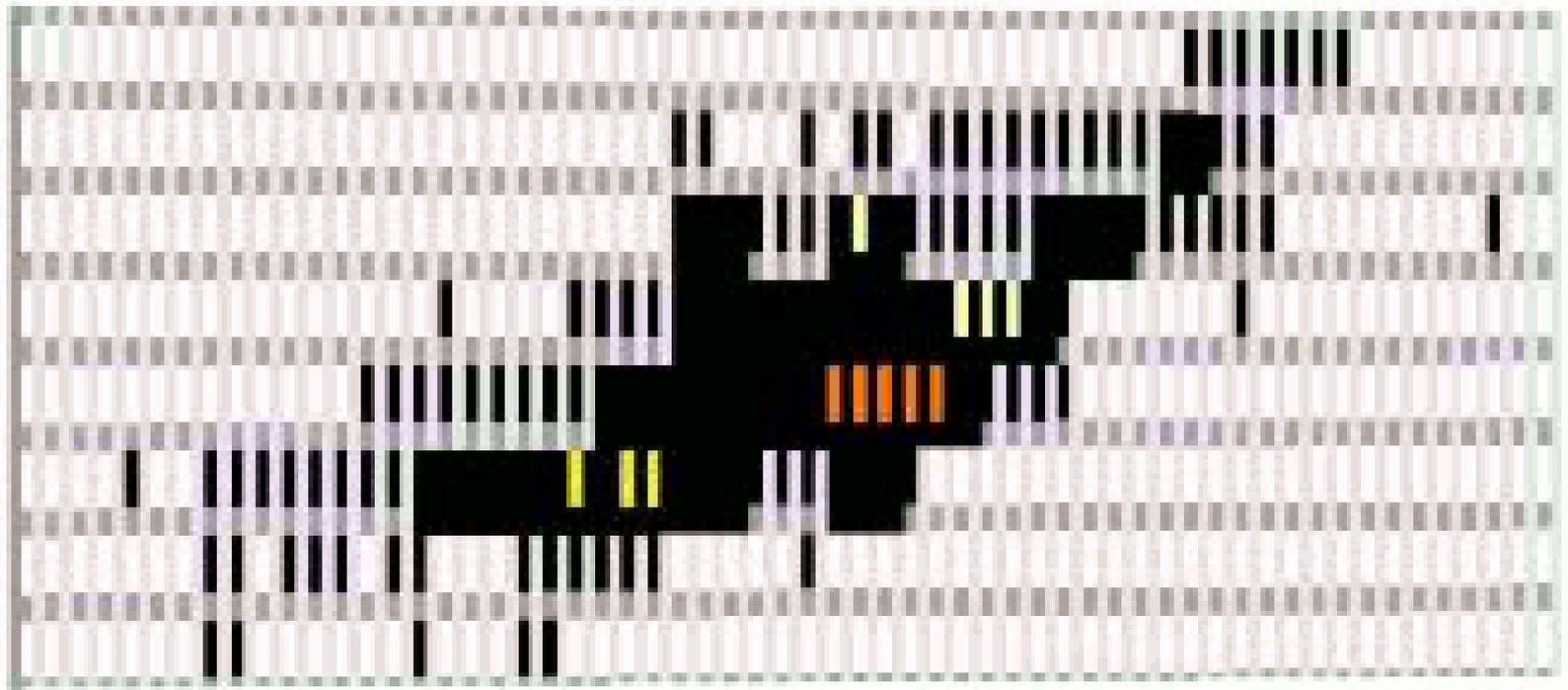
| | NORTH | EAST | SOUTH | WEST |
|--------------------------|-------|------|-------|------|
| 8:46 | Done | | Done | Done |
| 8:48 | Done | Done | | Done |
| 8:50 | Done | | | Done |
| 8:52 | Done | Done | Done | Done |
| 8:54 | Done | Done | | Done |
| 8:56 | Done | | Done | Done |
| 8:58 | Done | Done | Done | Done |
| 9:00 | Done | Done | | Done |
| 9:02 | | Done | Done | Done |
| 9:04 | Done | | | Done |
| 9:06 | | | Done | Done |
| 9:08 | | Done | | Done |
| 9:10 | Done | | Done | Done |
| 9:12 | | Done | | |
| 9:14 | Done | Done | | Done |
| 9:16 | | | Done | |
| 9:18 | Done | | | |
| 9:20 | Done | Done | Done | Done |
| 9:22 | | | | |
| 9:24 | | | | Done |
| 9:26 | Done | Done | Done | |
| 9:28 | | | | |
| 9:30 | | | | Done |
| 9:32 | Done | Done | Done | |
| 9:34 | | | Done | |
| 9:36 | | | | Done |
| 9:38 | Done | Done | Done | |
| 9:40 | | | | |
| 9:42 | Done | Done | | Done |
| 9:44 | | | Done | |
| 9:46 | Done | Done | Done | |
| 9:48 | | | | Done |
| 9:50 | | Done | | |
| 9:52 | Done | | Done | Done |
| 9:54 | Done | Done | | |
| 9:56 | | Done | | |
| 9:58 | Done | Done | Done | Done |
| 10:00 | | Done | Done | |
| 10:02 | | | | |
| 10:04 | Done | | | Done |
| 10:06 | | Done | | |
| 10:08 | | | | |
| 10:10 | Done | | Done | Done |
| 10:12 | | Done | Done | |
| 10:14 | Done | | Done | |
| 10:16 | | | | Done |
| 10:18 | Done | Done | Done | Done |
| 10:20 | Done | | | |
| 10:22 | | Done | Done | Done |
| 10:24 | Done | Done | | |
| 10:26 | | | | |
| 10:28 | Done | Done | Done | Done |
| | 28 | 26 | 24 | 28 |
| Total- 106 analysis Done | | | | |

WTC 2

116 out of 116

| | NORTH | EAST | SOUTH | WEST |
|--------------------------|-------|------|-------|------|
| 9:03 | Done | Done | Done | Done |
| 9:04 | Done | Done | Done | Done |
| 9:06 | Done | Done | Done | Done |
| 9:08 | Done | Done | Done | Done |
| 9:10 | Done | Done | Done | Done |
| 9:12 | Done | Done | Done | Done |
| 9:14 | Done | Done | Done | Done |
| 9:16 | Done | Done | Done | Done |
| 9:18 | Done | Done | Done | Done |
| 9:20 | Done | Done | Done | Done |
| 9:22 | Done | Done | Done | Done |
| 9:24 | Done | Done | Done | Done |
| 9:26 | Done | Done | Done | Done |
| 9:28 | Done | Done | Done | Done |
| 9:30 | Done | Done | Done | Done |
| 9:32 | Done | Done | Done | Done |
| 9:34 | Done | Done | Done | Done |
| 9:36 | Done | Done | Done | Done |
| 9:38 | Done | Done | Done | Done |
| 9:40 | Done | Done | Done | Done |
| 9:42 | Done | Done | Done | Done |
| 9:44 | Done | Done | Done | Done |
| 9:46 | Done | Done | Done | Done |
| 9:48 | Done | Done | Done | Done |
| 9:50 | Done | Done | Done | Done |
| 9:52 | Done | Done | Done | Done |
| 9:54 | Done | Done | Done | Done |
| 9:56 | Done | Done | Done | Done |
| 9:58 | Done | Done | Done | Done |
| | 29 | 29 | 29 | 29 |
| Total- 116 analysis Done | | | | |

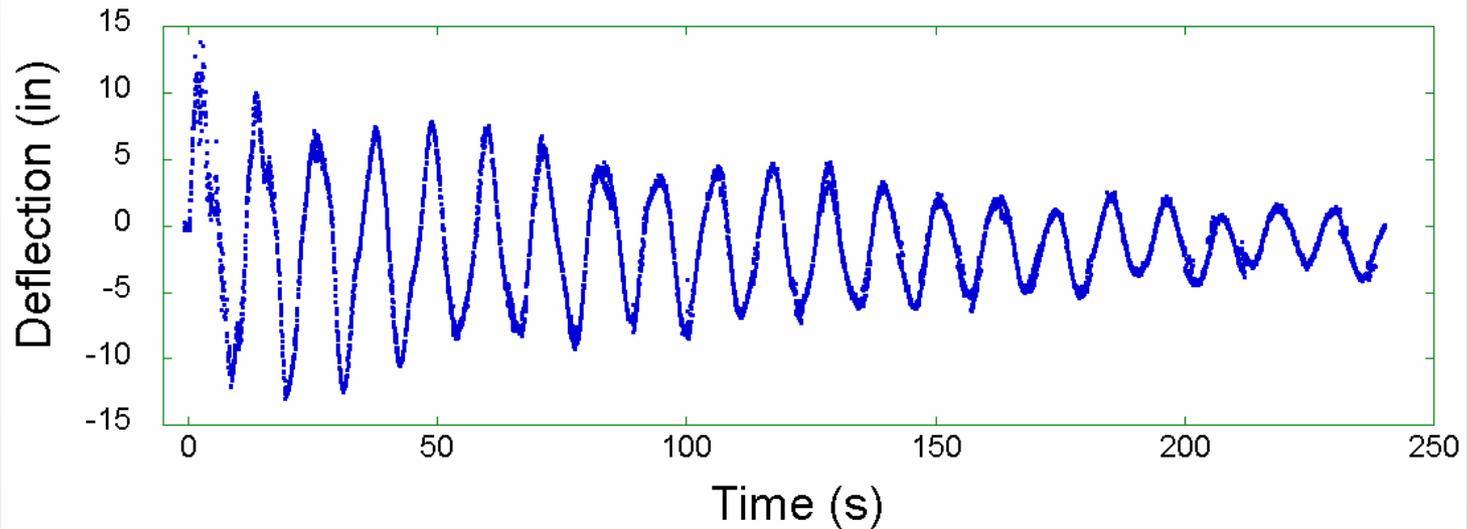
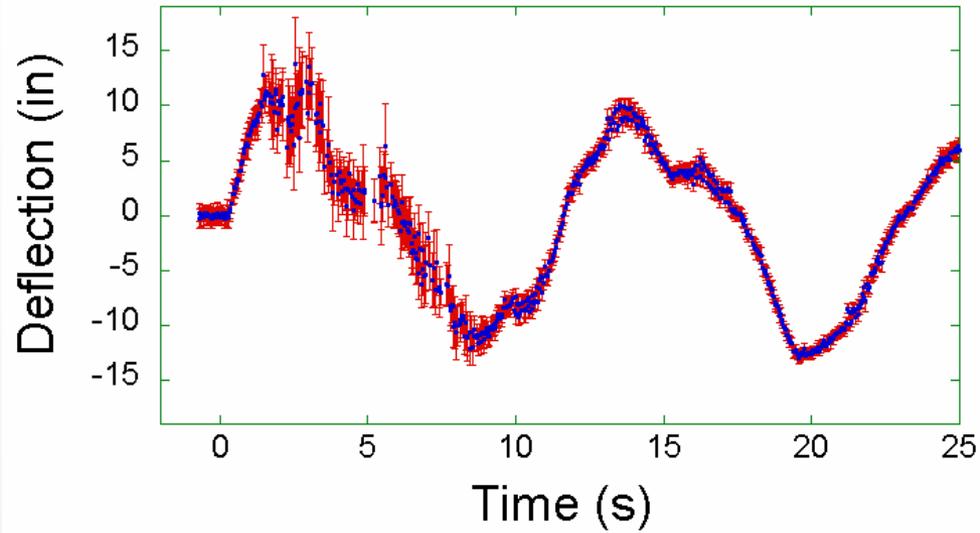
WTC 1 North Face



0:46:00.0



WTC 2 Deflection at 70th Floor



INTERACTIONS WITH OTHER PROJECTS (1)

- Project #2: Baseline Structural Performance and Aircraft Impact Damage Analysis
 - Provide photos and videos
 - Estimate Aircraft Speeds
 - Characterize Exterior Damage
 - WTC 2 Motion Analysis
- Project #3: Mechanical and Metallurgical Analysis of Structural Steel
 - Provide photos and videos
- Project #4: Investigation of Active Fire Protection Systems
 - Provide photos and videos

INTERACTIONS WITH OTHER PROJECTS (2)

- Project #6: Structural Fire Response and Collapse Analysis
 - Provide photos and videos of collapses of WTC 1, 2, and 7
 - Identify particularly interesting visual material (e.g., bending columns)
 - Video Analysis
- Project #7: Occupant Behavior, Egress, and Emergency Communications
 - Provide photos and videos
- Project #8: Fire Service Technologies and Guidelines
 - Provide photos and videos