

# SAFER Cities

Strong-motion Accelerographs For Earthquake Loss Reduction in Cities



COSMOS

A COSMOS-WSSI Initiative for Seismic Safety

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WSSI

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## BACKGROUND

Strong-motion instrumentation in many of the COSMOS agency strong-motion instrumentation programs are being replaced with recent versions of instrumentation more suited to individual agency needs. The instrumentation being replaced is often in good working order, but no longer meets the requirements of the host agency. Towards extending the useful life of the instrumentation being replaced and no longer used by the host agency, this project, entitled “*COSMOS Strong-motion Instrumentation For SAFER Cities*” is intended to facilitate the redistribution of these instruments. Recipients of the instruments must be non-profit organizations and agencies that would otherwise have little or no means of recording the next damaging earthquake in urbanized areas of the world. Objectives of the project, responsibilities of the various agencies and organizations, and procedures for redistribution of unused instrumentation follow.

## OBJECTIVES

Redistribution of strong-motion instrumentation to non-profit organizations for educational and nonprofit purposes to benefit society by:

- 1) Improving probabilities for acquiring quantitative strong-motion measurements in urbanized areas of the world with little or no means of recording the next damaging earthquake,
- 2) Providing quantitative measurements of ground shaking and the nearby built environment during severe earthquakes in order to better rebuild the society to resist future earthquakes,
- 3) Facilitating and stimulating interest in the acquisition of strong-motion measurements needed to improve earthquake resistant design and construction in urbanized cities with high seismic risk throughout the world.

## IMPLEMENTATION RESPONSIBILITY

The SAFER Cities Program will be implemented by COSMOS working in cooperation with its Strong Motion Program Members (SMPM), the World Seismic Safety Initiative (WSSI), and identified host organizations or institutions. The responsibilities and commitments of each participating organization are described below.

1 of 4



# SAFER Cities

A COSMOS-WSSI Initiative for Seismic Safety



## STRONG MOTION PROGRAM MEMBER (SMPM) RESPONSIBILITIES

- Sort unused instrumentation into categories:
  - 1) Ready for deployment
  - 2) Minor refurbishing required
  - 3) Major refurbishment required.
- Complete transfer of ownership procedures and paperwork for each instrument with serial numbers and other instrument ID information for formal transfer of ownership to COSMOS as a nonprofit US organization responsible for redistribution of the instrumentation for non-profit and educational purposes.
- Store instrumentation until it is ready to be shipped to COSMOS Instrumentation Recipient (CIR).
- Upon receipt of shipping request as approved by COSMOS, deliver category “1”) instrumentation with film, batteries, and trickle charger appropriate for redistribution to predetermined shipping site.
- Upon recovery of significant strong-motion recordings:
  - 1) Provide replacement instrument if appropriate,
  - 2) Digitize and process records as determined feasible and appropriate by any of the SMPMs.

## COSMOS RESPONSIBILITIES

- Establish distribution policies that satisfy property-transfer requirements of SMPM granting agency including receipt and transfer of ownership.
- Establish policy for review and selection of appropriate COSMOS Instrumentation Recipients (CIRs) via the SM Programs Board and the Board of Directors.
- Develop *COSMOS Instrumentation Request Form*.
- Develop *COSMOS Transfer of Ownership Form*.
- Develop *COSMOS Instrumentation Acceptance and Deployment Forms*.
- Develop *COSMOS Maintenance Guidelines Report*.
- Develop plan for data recovery, digitization, and dissemination via COSMOS VDC.
- Provide local seismic education assistance material to CIR.
- Help develop resources external to COSMOS for shipping, training, supplies, and data recovery.

## WSSI RESPONSIBILITIES

- Serve as international liaison between COSMOS and IAEE, other professional engineering societies, and local and national governments to facilitate seismic safety through the acquisition of an improved quantitative basis for earthquake resistant design and construction.



## SAFER Cities

A COSMOS-WSSI Initiative for Seismic Safety



- Identify potential candidate organizations and agencies to serve as CIRs.
- Help develop resources for shipping, in-country training, instrumentation deployment, supplies and maintenance.
- Help develop plan for in-country data recovery appropriate for intended use.

### **COSMOS INSTRUMENT RECIPIENT (CIR) RESPONSIBILITIES**

- Submit completed COSMOS Instrumentation Request Form, which includes description of intended use and deployment resources.
- Submit completed COSMOS Instrumentation Acceptance Form with agreement to use the instrumentation for educational and non-profit purposes with no options for resale.
- Submit completed COSMOS Deployment Form once installation is complete.
- Maintain Instrumentation according to COSMOS Maintenance Guidelines Report.
- Return recorded data that is significant to COSMOS for digitization by one of the CORE agencies and dissemination via the VDC.
- Follow procedures agreed to on COSMOS Instrumentation Acceptance Form for return of recorded data as either:
  - 1) Undeveloped film canister, or
  - 2) Intact in original instrument to be replaced with new instrument, or
  - 3) Developed film.

### **INSTRUMENTATION REQUEST AND DEPLOYMENT PROCEDURES**

- 1) Potential CIRs are identified through COSMOS and WSSI from both solicited and unsolicited proposals.
- 2) Potential CIRs fill out *COSMOS Instrumentation Request Form* with resources identified through in-country resources, WSSI, and COSMOS for shipping costs, deployment resources, batteries, maintenance visits, and data recovery.
- 3) A *COSMOS SAFER Cities Task Group*, chaired by the Executive Director of COSMOS, with membership approved by the Strong-Motion Programs Board shall review COSMOS instrumentation requests. Requests shall be reviewed according to guidelines provided by COSMOS and the instrument-granting agency, if appropriate. The Task Group shall make recommendations regarding approval of the requests to the Strong-motion Programs Board for final approval with periodic review by the Board of Directors.
- 4) *COSMOS Transfer of Ownership Form* filled out by COSMOS and SMPM granting agency with serial numbers etc.
- 5) CIR submits completed *COSMOS Instrumentation Acceptance Form*.
- 6) SMPM delivers instruments ready for deployment to predetermined shipping site.



## SAFER Cities

A COSMOS-WSSI Initiative for Seismic Safety



- 7) Instrumentation and *COSMOS Maintenance Guidelines Report* shipped by COSMOS representative with shipping costs to be provided by COSMOS, WSSI, or CIR.
- 8) CIR sends in completed *COSMOS Deployment Form* once installation is complete.
- 9) CIR submits recorded data to COSMOS according to predetermined procedure.
- 10) SMPM or CORE agency with interest digitizes and processes recorded data for dissemination via the COSMOS VDC.