Progress and Group Discussion
Computer Vision 1

- **Image Mosaicing** 1-3 months
  - System requirements definition and data collection.
  - Literature survey of Image Mosaicing techniques.
  - Choice of the best approach, or of a combination of several different techniques allowing a effective implementation of the system in the tunnel environment. Development environment set-up and implementation.
  - Validation and 3rd month report write down.
  - Next 3 months work plan definition.
Computer Vision 2

• **Image Registration on known 3D geometry.** 4-6 months
  - We hypothesize a rough knowledge of the scene 3D structure, i.e. of the tunnel ceiling shape, and develop a way to perform image registration on the given surface

• **Reconstruction (still just a proposal)** from 7 months
MEMS & Power harvesting

- 6 Month Deliverables
  - Bologna
    - First fabricated devices from process.
  - Cambridge
    - Open loop testing of Tronics devices completed.
    - Closed loop circuit design started.
  - Bologna/Cambridge/Prague
    - Detailed specification for MEMs device performance, including measurements using convention crack gauges for comparison.
    - Document specifying packaging schemes for MEMs devices.
MEMS & Power harvesting

- 12 Month Longer Term Targets
  - Bologna/Cambridge
    - Tests completed on devices fabricated in Bologna.
    - Open loop operation packaged devices.
    - Functionality of unpackaged closed loop circuits.
Actions - Prague

- Install Crack Meters to Specify movements of Cracks in Tunnel – Possibly use data logger in addition to periodic manual monitoring.
- Supply feedback on specifications for MEMs devices (strain resolution, temperature sensitivity, sensor configuration (shear etc.? Devices every 60° / 45°?).
- Supply Details of Existing Crack Gauges to Bologna Prague – mountings, resolution, temperature sensitivity etc.
- Send details on suitable epoxies for mounting strain gauges to Cambridge – cast iron / concrete etc. London Underground may also have info on this – James to contact Peter Wright.
Actions - Cambridge

• 15th May – Provide Feedback to Bologna for first Mask Set.
• Measurements on Tronics Devices.
• Collaborate with Bologna on Packaging.
• Begin Circuit Design.
• Continue Initial Investigations for Power Harvesting.
Actions - Bologna/Cambridge

- Work on initial ideas for packaging MEMs devices.
- First Trials on Packaging Solutions.
- Alberto to visit Cambridge when Tronics devices are being tested.
- Continue Initial Investigations for Power Harvesting.
WSN – 6 months

- Measure power consumption of Motes (Cambridge)
- Attach new sensors to Motes (e.g. anemometers, tiltmeters, motion detector, crackmeter) (Cambridge)
- Data management on stargate (Cambridge)
  - 1 create new data file everyday
  - 2 send out data file by ftp
  - 3 reboot daily
- WSN network in LUL (Cambridge)
- Martin Vanicek to visit Cambridge (in June?) to learn use of hardware and diagnosis software (Cambridge and Prague)

- 6 month reports - Report on installation in Prague to be produced and translated (Prague)
WSN – 12 months

• 2 sites in Prague with WSN (Cambridge and Prague)

• 12 Month reports - Installation protocol for wireless sensor networks (Cambridge and Prague)
Analysis – 6 months

• Prague group will send to UPC group in about 1 month, information on Geometry, History, Ground investigation, Sensors Data, Information regarding the Flood event last 2002, etc.
• UPC group will perform a direct analysis of the section.
• London Underground will collect data suitable for future back analyses (sections instrumented, Ground investigation available, etc.). That data will be available for the UPC group by the end of this 6 month period.
Analysis – 12 months

• UPC will perform a Back analysis of the section considered in Prague Metro.
• UPC will carry out a direct analysis of the selected section from London Underground.