Future City Junior Orientation 2019-20

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Regional Coordinator

www.dfwfuturecity.org

Agenda

- Overview of program
- Understanding project phases
  - Specific rules and guidelines
  - Resources
  - Deliverables
  - Timeline
- Online Team Center
- Competition Day
- Tips and Lessons learned

A Brief History

- Future City Competition
  - Provided by DiscoverE (formerly National Engineers Week Foundation)
  - NTX Region began in 2000-01
  - More than 600 students involved annually from more than 50 schools
- Future City Junior Competition
  - Started in North Texas
  - 6th year
  - 26 teams from 9 schools (2018-19)
  - 23 schools registered 2019-20

2019 North Texas Sponsors

Bentley Advancing Infrastructure

Summit Consultants, Inc.

Brandt

AECOM Hunt

IEEE

ACEC Dallas

APA TX

ASCE American Society of Civil Engineers

IEEE PES Power & Energy Society

INCOSE

ISA

SPE International Society of Petroleum Engineers

texite

Water Environment Association of Texas

ASQ

NCEES advancing licensure for engineers and surveyors

PMI

TSPE

Registered Groups 2019-20

- Andrews Elementary, Plano
- JA Arthur Intermediate, Kennedale
- Barton Creek Elementary, Austin
- Chapel Hill Academy, Fort Worth
- Corinth Elementary, Corinth
- James Delaney Elementary, Kennedale
- DiscoverSTEM, Plano
- Donald Elementary (LISD STEM), Lewisville
- IW Evans Intermediate, Bonham
- Harmony Science Academy, Grand Prairie
- Hatfield Elementary, Justin
- Justin Elementary, Justin
- Paragon Prep, Austin
- Dan Powell Intermediate, Fort Worth
- Prairie View Elementary, Rhome
- Martha Reid Elementary, Arlington
- Ruby Young MESMA, DeSoto
- St. Andrews Catholic School, Fort Worth
- The Village School, Houston
- Washington Middle School, El Dorado, AR
- Watson Technology Center, Garland
- The Westwood School, Dallas
- Gilbert Willie, Sr. Elementary, Terrell

What is Future City Junior?

- Project-based educational program
  - Introduction to Future City Competition

- Skills learned:
  - Problem solving
  - Teamwork
  - Research, writing
  - Math, science, engineering

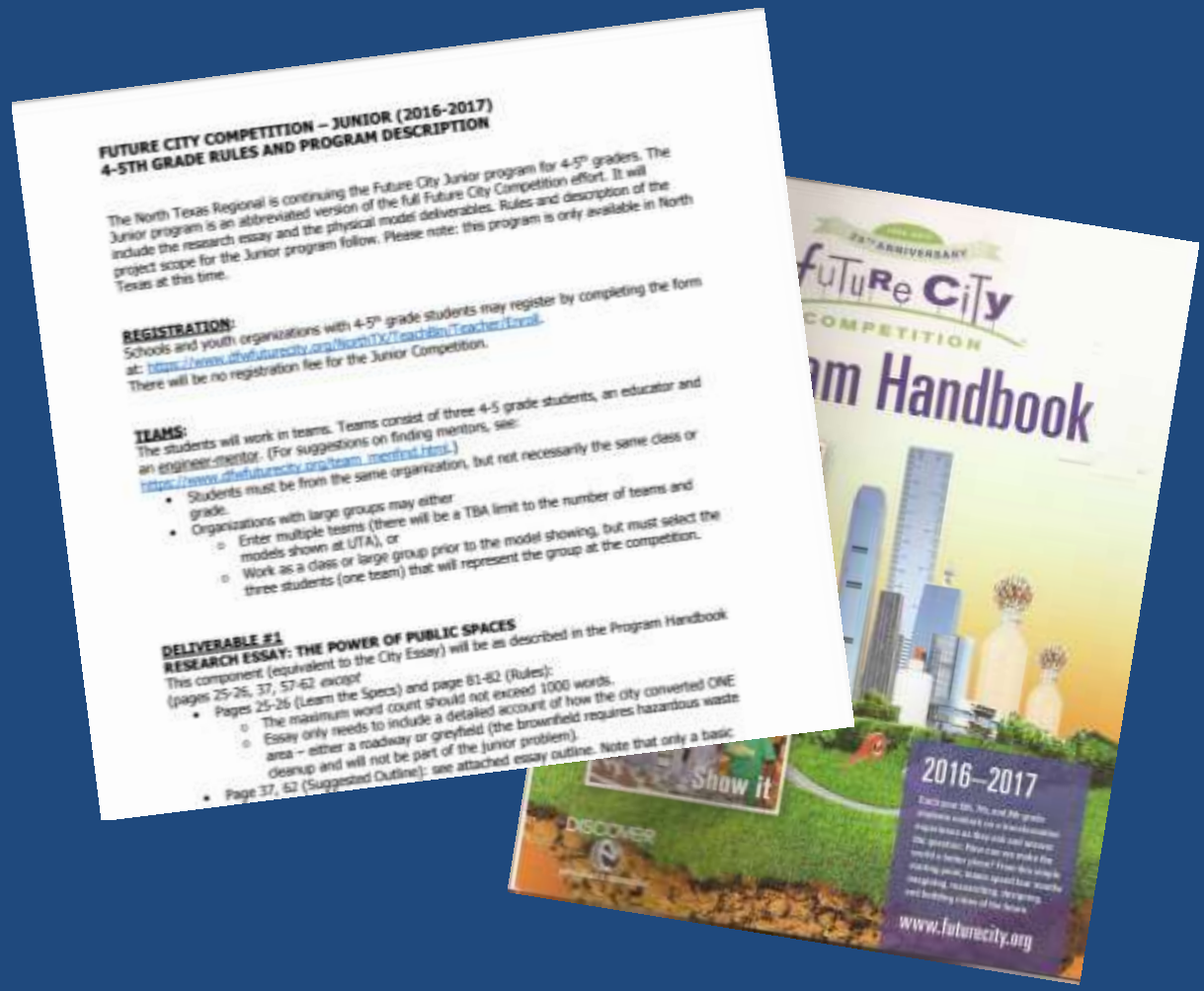
What is Future City Junior?

- The Challenge:
  - Use engineering to solve a problem facing cities in the future
- Project phases, goals
  1. Form the team
  2. Research problem
  3. Write paper
  4. Build physical scale model
  5. Stay within budget
  6. Display model for judges
  7. Answer questions

Where to Find Answers

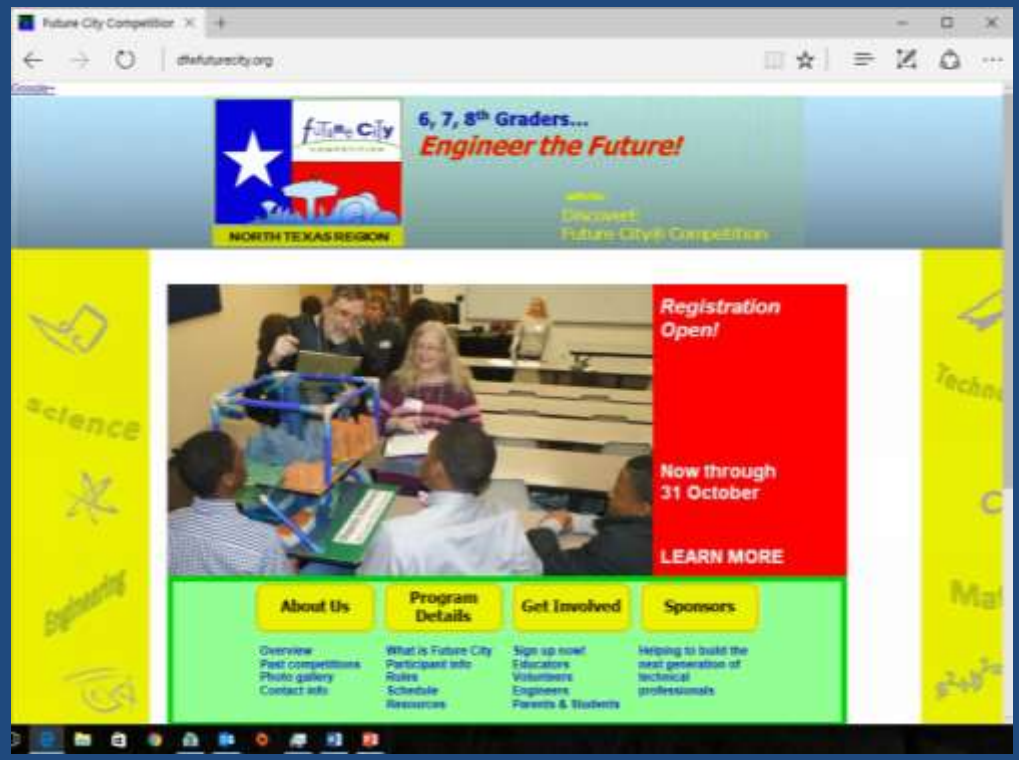
- NTX FCC Junior Rules & Rubrics

- Program Handbook
  - Rules
  - Teaching points
  - Background information



Two Websites: NTX Region, National

- NTX Regional www.dfwfuturecity.org
  - Region-specific info
  - Schedule, due dates
  - Local resources
  - Program updates



FC NTX Team Center

www.dfwfuturecity.org/team_junior.html

- Team Center – *Bookmark it!*
- First stop for all local information
  - Schedule, rules
  - Program updates
  - Resources
- Login

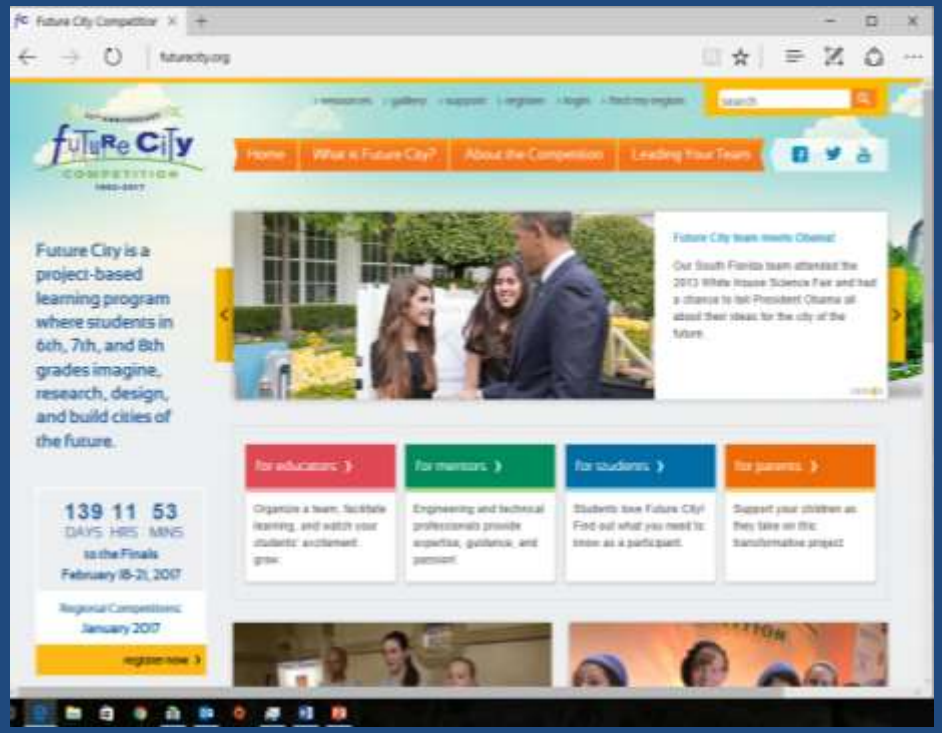
Enrolling Teams in the Team Center

www.dfwfuturecity.org/team_junior.html

- Team Center – *Bookmark it!*
  - First stop for all local information
    - Schedule, rules
    - Program updates
    - Resources
- Create and manage teams
  - Assign team members
  - Submit deliverables
    - Automatic confirmation of submission
  - Download team scores
    - Available after the competition

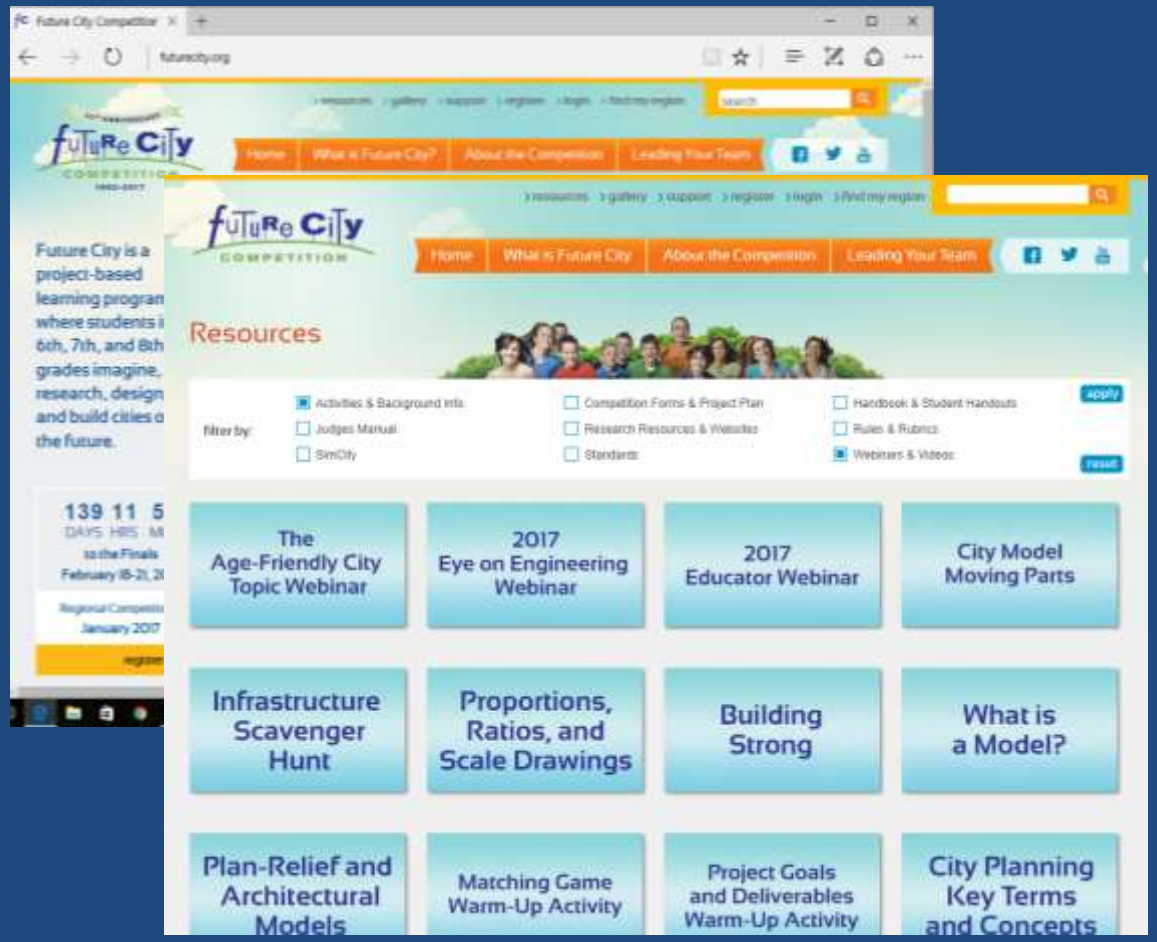
National Website

- National futurecity.org
  - *Middle school competition only*
  - Overall program info
    - Program description
    - General resources



National Website

- National futurecity.org
  - Overall program info
    - Program description
    - General resources
      - Handbook
      - Webinars & Videos
      - Background info & Activities
        - Team building
        - Understanding scale
        - Mapping
        - City planning



Online Resources

- NTX Team Center site
  - Orientation workshops
  - Mentor information
  - Essay Resources
    - Examples of best essays
  - Model Resources
    - Pictures of models

- National website
  - Handbook
  - Activities
    - Team building
    - Model building and scale
    - Mapping
    - City planning
  - Essay research resources
  - Webinars
    - Essay topic
    - Engineering
    - Models

If you still can't find the answer …

- Ask
  1. Region coordinator
     regional@dfwfuturecity.org

  2. Junior school coordinator
     ericrobinson@dfwfuturecity.org

  3. Region school coordinator
     jfreer@gmail.com

Build the Team

Teams

- Schools/organizations are represented by teams
  - 3 students, 1 educator/sponsor, **1 engineer-mentor**
- Students – must be from the same organization
  - Don't have to be from the same class or same grade
  - 4-5th grade students eligible
- Large groups may:
  1. Enter several 3-4-person teams (max TBA teams)
  2. (Prior to the model judging) Work in a large group/class, i.e., more than 3 students, 1 sponsor, 1 mentor
     - At the competition (model judging) you must have a team (3 students)
- Prizes are given to 3-person teams

Teamwork

- Teamwork is an important part of the program
- Decisions are reached by consensus
- Everyone contributes
  - Agree on assignments
  - Agree on responsibilities

- Resources:
  - Team building activities on National FC website
    - Teambuilding, brainstorming, conflict resolution

Finding an Engineer-Mentor

- Parents of students, PTA newsletter
- Spouse or friend of educators
- School/organization business partner
- City bureau of engineers
- TX DoT
- US Army Corp of Engineers
- Local engineering firms
- National Engineers Week sponsors (www.discovere.org)
- Local Chapters of Engineering societies
- Regional Mentor Coordinator – Tom Hunt

Engineer-Mentor

- Involved in all phases of the competition
- Advisor, coach
  - Students do all the work, make all the decisions
- Provides real-life engineering experience
  - Project planning
    - Scheduling
    - Setting realistic goals
    - Helping to assign tasks
  - Understanding roles of engineers, engineering disciplines
- Resources:
  - Mentor coordinator
  - Online tips, advice, webinars

Ethics and Roles

- Future City is an educational program
- Rules are designed to ensure a fair competition
- Students envision the city and do all the work
  - Brainstorm, research, writing, model building
- Adults provide guidance and advice
  - Should be present when teams work with tools, build models
- Everyone adheres to the rules
- Team members sign and submit an Honor Statement
- Due January 10-15
  - Upload through the Team Center

Research Essay

Research Essay

- Goal of the writing exercise
  - Verbally describe the city of the future
  - Develop effective research skills
  - Investigate solutions to the assigned topic
    - Analyze tradeoffs of possible solutions
    - Select the best solution
  - Understand technology required
  - Become familiar with engineering roles in city design and operation

Research Essay

- 2020 Topic: “Clean Water: Tap into Tomorrow”
  - Select one threat to the city drinking water supply
    - Natural disaster, pollution, over-population, etc.
  - Design a resilient water supply system
    - Withstand the threat and/or
    - Quickly recover from the threat

City Essay Outline

- Introduction and overview
  - City basics – overview description of the city
- Define the problem
  - Describe water supply system
  - Describe threat
    - Its effect on water system
    - The effect on other infrastructure, services, population
- Develop one solution
  - Innovative and futuristic
  - Engineering and technology involved
  - Benefits, tradeoffs
- Conclusion
  - How your design will make your city a safe, pleasant place to live

Research Essay

- Rules
  - Word limit: 1000 max; Graphics: 4 max
  - Include bibliography with min of 3 sources
- Resources
  - List of topic resources online and in handbook
  - Examples of past best essays online
  - Tutorial webinar recording

Essay Deliverable

- Document (doc format)
- Upload through Team Center
- 60 points
  - Scored on creativity, how well you explore/explain the issues, use of new technologies, role of engineers, writing skills
- Due November 29
  - Submissions from Nov 30-Dec 20, -5 points
  - Submissions after Dec 20, not accepted

Physical Model

Goal of the Physical Model

- Opportunity to finalize city design
- Learn about scale and how to apply it
- Implement a moving part
- Study power sources to drive the movement
- Work within constraints of a budget

Physical Model

- A creative representation of a section of your city
  - Illustrating the solution to Clean Water: Tap into Tomorrow
- Built “to scale”
  - You select the scale
  - Apply scale consistently in all three dimensions
- Model size: 25” (w) x 36” (l) x 20” (h)
  - Not to exceed
  - Includes all supporting structures, all moving parts, all extension parts (hinged doors, drawers, access panels, etc.)

Physical Model

- Model Weight – no specific limit
  - Kids should be able to move it
- Materials
  - Recycled materials encouraged
  - No live animals, no perishable items (e.g., no Jello)
- At least one moving part
  - Manually moved, blown on, spring driven
  - Electric – self-generated, battery powered, NO plugs

Model Budgeting

- Cost of materials for model cannot exceed $50
  - Recycled materials (plastic bottles, cans, boxes, etc.) — $0
  - Used items (toys, building materials, etc.) — Fair market value *
  - Donated items, Borrowed items — Fair market value *
  - Purchased items — Receipts
  - 3D printed items — Valued per handbook
- Document expenses on Expense Form
  - Bring to UT Arlington with model

** Fair market value = garage sale or E-bay price*

Physical Model Resources

- FC activities
  - Understanding scale
  - Model construction
- Team Center Resources page
  - Pictures of past models

Physical Model Deliverable

- 3-D scale model of a section of your city
  - Showing the Clean Water Supply solution
  - Must have a moving part and be self-powered
  - Cannot spend more than $50 on materials
- Expense Form
- Model ID card
  - City name, team member names, school/org name
  - Scale
- 60 points
  - Scored on creativity, realism, accuracy and scale, quality of workmanship
- Due January 25
  - Deliver to UT Arlington

Q & A Session

Q&A Session

- Goal of the Q&A session:
  - Demonstrate teamwork
  - Speak confidently to judges
  - Think on your feet responding to Q&A
  - Express ideas clearly

Display model and answer questions

- Q & A Session
  - During model judging
  - No formal presentation
  - Students only
    - Adults may observe, but not participate
  - 3-4 panels of judges will spend max 5 minutes each discussing model and solution to theme question
- 10 points of the 60 point model rubric
  - Teamwork and knowledge
- Due January 25
  - UT Arlington

Required Forms

All forms available on Team Center Resources page

▪ Home school affidavit – Home schools only	Mail to Regional Coord.
▪ Expense Form	Bring to UTA w/ model
▪ Model ID card	Attach to model
▪ Honor Statement	Team Center upload
▪ Media Waiver Form	Upload or Bring to UTA at check-in

North Texas Regional Future City Junior

Program Timeline

Oct 31	Registration deadline
Oct-Nov	*Research essay topic*
	Students begin essay writing
Nov 29	Research essay due
Dec-Jan	*Students work on model and Q&A*
Jan 25	Team check-in, deliver model to UTA
	Competition and Award ceremony

N TX Regional Competition Day
January 25, 2020

Half-day (~ 5 hours)

Team Check-in
- Team brings model to UT Arlington

Model setup, team photos

Jr. model judging and Q&A (~1 hour)
- All student teams

Free time (~1 hour)
- Engineering challenge activities in atrium

Awards ceremony
- FC Junior awards

Check In

- All teams – Bring with you:
  1. Model with ID card
  2. Expense Form
  3. Media Waiver Forms *
- At check-in you will get:
  1. Folder with schedule, program, rules, survey form
  2. Chits for t-shirts, gifts
  3. Ballots to vote on best model
  4. Badges

Display model and answer questions

- All teams and models
  - Judged simultaneously
- Model judging
  - Several panels (or groups) of judges circulating
  - 3-4 judging panels score each display
  - Informal Q&A, discussion
  - Max 5 minutes per judging panel
  - Students only
    - Adults may observe, but not participate

Awards Ceremony

- FC Junior awards
  - Best Essay
  - Best Model
  - Best Overall
  - Special awards
    - Peoples' Choice Best Model
    - Green City
    - Energy Efficiency
- Awards
  - Plaque-Certificate
  - Gift cards

No One Walks Away Empty-Handed

- Each student team member receives:
  - Certificate of accomplishment
  - T-shirt
  - Other FC “goodies”
- Educators and Mentors receive:
  - T-shirt
  - Thank you gifts
  - Team pictures
  - Score reports
  - Copies of judges comments

Lessons Learned

- Engineer-Mentor is necessary
- This project takes time
  - Educators – 30-40 hours
  - Mentors – 10-20 hours
  - Students
    - Build model – 20-30 hours
    - Essay – 8 hours
- Don’t wait until January to start model
  - Start collecting recyclable “building” materials now

Lessons Learned (cont'd)

- Keep parents informed
  - Letter to parents (sample on website)
- Winning teams are successful on all phases
  - But, Penalties for late work won't kill your chances
  - Not completing the essay won't disqualify the team
- Read the NTX Rules for FC Junior Competitionn and consult the handbook
- Educator and mentor act as advisors, not designers
- Consider bringing in topic-area experts

Regional Committee

Regional Coordinator	Jean Eason
Junior School Coordinator	Eric Robinson
Judging Coordinator	Richard Reppert, Erin Eason
Mentor Coordinator	Tom Hunt
Volunteer Coordinator	Jacquie White
Photos, Prizes	Diane Collier
Special Awards	John Colotta, Tamara Cook
Public Relations	Katia Gomez
Facilities	Dave Davis

Essay Outline

- Introduction and overview
- City basics – overview description of city
- Describe the public spaces problem
- Describe the solution
  - Conversion of a space
  - Engineering involved
  - Benefits, tradeoffs
- Conclusion