

**SidneyPacific**

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# Sidney Pacific 3D Printer Proposal

Town Hall Meeting

3/9/2017

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# Proposal Outline

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- Motivation
- Short/ Long proposal
- Proposed 3D printer and Specifications
- Proposed Usage Model
- Location and Safety
- Proposed Timeline and Maintenance
- Costs
- Evaluating Success

# Why at SP?

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- **CopyTech**
  - \$2 per hour
- **Protoworks**
  - Part of Martin Trust Center, takes priority
- **Edgerton**
  - Not conducive for “after work” hobbyists
- **Makerlodge**
  - Priority for undergraduates
- **Beaverworks**
  - Farthest from campus
  - Lots of training needed
- **Hobby Shop**
  - \$40 per term



# Why at SP?

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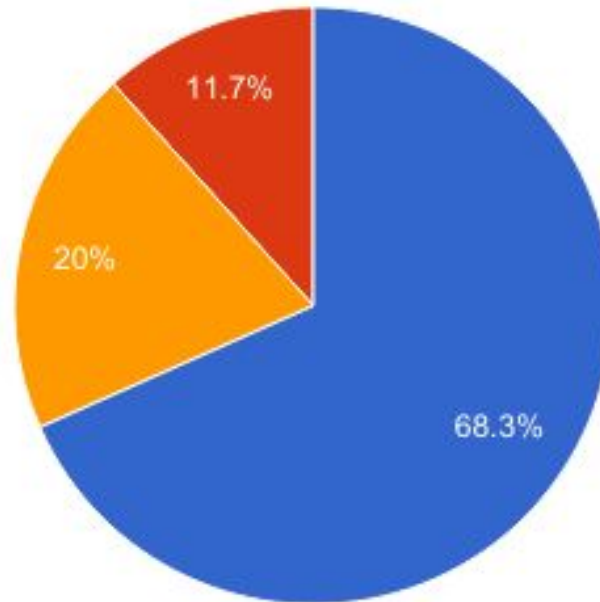
- Accessible to people “after work”
  - Close to home, because it’s at home!
  - Accessible at all hours
  - Low barrier for residents to explore
- Cheap
  - Operational costs are far less than subsidizing costs for usage elsewhere
  - \$0.10 per hour to run

# Why at SP?

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- Interest Groups Survey (60 Responses):

If SP had a 3D printer, would you use it?



● Yes ● Maybe ● No

# The Idea

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- Short Term:
  - Acquire a 3D printer for the House.
  - Allow residents to use.
  - Print all the things!
- Long Term:
  - Get more equipment
  - Allow for residents to build cool things!
  - Acquire external funding
  - Take over a noisy room for a makerspace?

# The Printer

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- Lulzbot TAZ6



# Specifications

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**Print Area:** 280mm x 280mm x 250mm

**Top Print Speed:** 200mm/sec

**Minimum Feature:** 0.5mm

**Layer Height:** 0.05 – 0.5 mm

**Filament Size:** 3.00mm

**Bed Type:** PEI on Glass

**Head Type:** All Metal Hexagon

**Material Type:** Hard Thermoplastics



# Usage

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- Control model:
  - Control computer manages the printer software and tracks usage
  - Online calendar allows users to sign up for time
  - Residents who want to use the printer get trained on how to use the printer, trainings every weekend
  - Trained residents can bring .stl files, run Cura, submit print job
  - Printing will be free for 6 months



# Usage

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- Trainings and CAD:
  - Trainings will be held weekly, or by appointment if needed
  - “How to use Solidworks for 3D Printing” document will be posted on the website
  - Solidworks, although free for students, will also be installed on select computers in the computer lab
  - If there is demand, “How to CAD” seminar will be held

# Location

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- 5 and 6F Common Area
  - Printer will be enclosed, it will be quiet but not silent.
  - Keeping it in an open space encourages usage and resident viewing.
  - Enclosure allows for constant printer environmental temperature
  - Enclosure ensures safety

# A note on safety

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- PLA will be used due to low VOC off gassing and low UFP generation
  - PETG also a possibility if there is demand
- Printer enclosure ensures minimal exposure during printing
- If there is concern, EHS can come and do an analysis of the printer.

# Timeline

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- **By April:** Acquire and set up printer, enclosure, computer and workbench
- **By May:** Set up control computer software with user accounts
- **By June:** Organize and run training sessions for residents

# Maintenance

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- Maintained by VP of Resources and VP of Information
  - Responsibilities:
    - Buying of Plastic
    - Trainings
    - Control Software
    - General maintenance and upkeep
  - 6 months workflow analysis
  - Combine with IT Chair?
  - New “Makerspace Chair” Position?

# Allocated Capital Costs

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- Equipment Cost breakdown: \$3500
  - **Printer: \$2500**
  - **Enclosure: \$250**
  - Desk: \$250
  - Computer - \$500
- Funding Sources:
  - Reserves/ House Manager

# Allocated Variable Costs

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- Variable Cost breakdown: \$800
  - PLA for Summer - \$300
  - PLA for Fall - \$300
  - General maintenance - \$200
- Funding Sources:
  - House Tax
  - New Sources?



# Allocated Cost Comparison

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- Resource maintenance costs
  - **AV** - \$300-\$600 per quarter (House Tax)
  - **Aquarium** - \$150 per quarter (House Tax)
  - **Gym** - \$250-\$300 per quarter (House Tax)
  - **Toner** - \$450 per quarter (House Tax)
  - **Bike Share** - \$300 per quarter (House Tax)
  - **Music** - \$250 per quarter (House Tax)
  - **Plants** - \$200 - \$400 per quarter (House Tax)

# Allocated Cost Comparison

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- **Comparable event costs (per person)**
  - **Outings**
    - \$10 per person
    - 20-30 people or \$200-\$300
  - **Hall Counselors**
    - 1 event per month
    - \$250 per 50 residents
  - **SPICE**
    - \$12 per person subsidized
    - Usually 10-20 people per event



# Evaluating Success

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- 25-50 unique users per quarter
  - This is inline with what we spend already in other areas on a per event basis
  - This is inline with the IGroups Survey
- High Usage
  - Used 4 of 7 days of the week
- Community Building
  - Lowers the barrier for hobbyists and successfully meets their needs

# The Backup Plan

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The Heads of House have agreed to buy the printer if it is underused or not feasible to keep