

**Adaptability Analysis And Future Development Planning of  
Xiaozhuang Village And Surrounding Area In Chenggong  
County, Kunming City, Yunnan Province, China**

**Cooperation Between Yunnan Arts University and the  
University of Colorado**

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## 2. Introduction to Xiazhuang Village

Xiazhuang Village Setting



The site selected for this analysis is Xiazhuang Village, located in Chenggong County of Kunming City. The village is currently used as a residential area with a high rural population. The land in the village has been expropriated for the development of new university campuses and other institutional facilities. It is adjacent to Kunming Medical University in the north, Yunnan Arts University in the south, Yunnan University of TCM in the west and first phase of the eviction site in the east. The topography of the project site is mostly level, with little ancient or significant vegetation. However, there is a historically preserved building located in the village named Wanfeng Temple. It is estimated that the development of institutional campuses adjacent to the village will have significant cultural, economic and environmental impacts on the historic village.

Based on a development plan, the Chenggong campus of Yunnan Arts University will take up an area of 133 acres and accommodate about 8000 students. Seven areas will be developed inside the campus including a public teaching area, college teaching area, students living area, physical exercise area, junior faculty living area, international cooperation area and an area reserved for future development. The overall building area will be up to 289,300 square meters. This planned campus will be 6 kilometers away from the downtown of Chenggong. To the north of the campus, there is a residential area with a 30 meter wide road. To the west of the campus lies the Yunnan University of TCM with a 40 meter wide road. In the east of the campus, it is the site of infirmary of Yunnan University of TCM. In the south, there are the Laoyuhe river and Guanshan mountain. The side entrance of the Yunnan Arts University faces to the main entrance of Xiazhuang village where there is ease of access and close interrelation.

The site of Chenggong campus of Yunnan Arts University was previously utilized as agricultural land by Xiazhuang village. This agricultural space has been removed gradually as the new campus has been built. The redevelopment of agricultural land has already taken an economic toll on residents of the village. The arrival of this new campus also promotes the redevelopment of Xiazhuang village itself. Currently, the north section of a street located at the south linear area of Xiazhuang village is being redeveloped. As a result of this development, villagers have utilized the existing businesses or transformed the first floor of their houses to open retail stores, restaurants and a new market. The market was relocated from its original site inside the village to be along the street which meets the demands of both students and villagers. The new businesses carry goods to serve residents of the village as well as students from the surrounding campuses. The village has undergone a transformation in response to the surrounding developments, and the resulting consequences are threatening the significant cultural and environmental heritage of the village and its people.

This is an example of how large scale urban growth, prompted by government policy, is removing areas with significant historical character from the urban setting. (Yao 2011) Based on the impacts of these developments, a strategy should be created to recognize significant and changing features of the village. The intended outcome of the strategy is to recognize threats to the historic village setting and allow it to adapt to the changing environment. This should be accomplished while allowing the village to maintain its cultural and environmental significance . In response to this need, a collaborative group of students from the University of Colorado and Yunnan Arts University developed a framework of analysis to document existing conditions in the village. The process of utilizes a morphological perspective to document the evolution of significant features in Xiazhuang Village. Morphological analysis attempts to define the spatial structure of a city by measuring the patterns of its components as they develop through time. (Yao 2011) In this context, morphological analysis allows for an understanding historical urban forms and how they can be integrated into contemporary urban fabric. The analysis framework is meant to identify important economic, cultural, environmental and infrastructural centers and spatially define their progression through a staged development process.

During the early stages of this project, students were asked to perform a qualitative analysis of three significant case study centers in the village. Several site visits were organized to allow for quantitative and qualitative data collection at various scales and resolutions. After completing data collection and analysis of village centers, the team created a design scenario for each case study area in Xiazhuang Village. The resulting design scenarios were intended to create a collaborative platform for the redevelopment of Xiazhuang Village that will allow the village to be integrated into the changing urban environment while preserving important historical and characteristics.

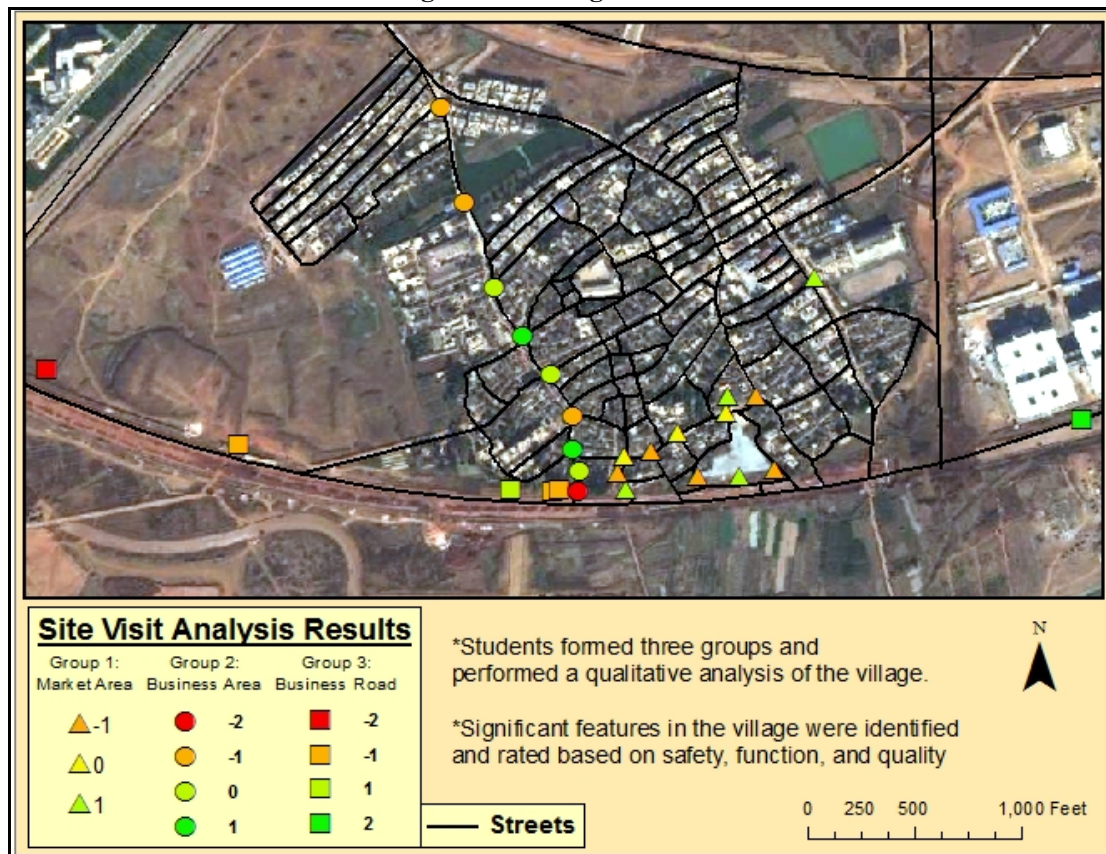
### **3. Methodology and Data Collection**

In order to perform an effective analysis of the city, a framework was developed to identify case study areas within the village and perform high resolution data collection through a series of site visits. The initial site visit consisted of a basic walk through of the village to identify significant village centers to serve as case study areas. After the first general visit to the village, three case study areas were identified. The three case study areas included the market area, the business road and the central business area of the village.

The next step was to organize students into three data collection teams. Each team would focus on a single case study area. The teams consisted of 4-5 people and were supplied with aerial imagery and photo cameras to identify infrastructural, public amenity, and other significant point feature data within the village. Group one performed analysis of the market study area, group two analyzed the central business area and group three performed a site analysis of the business road.

The information collected included both qualitative and quantitative information, describing the location and condition of significant features in the case study areas. Each feature was ranked on a scale from -2 to +2 based on their condition and impact on the quality of life within the village. A text description of each point feature collected was included and used to define existing conditions and opportunities for improvements. The data collected was input to a Google map, exported as point feature data in KML format and input to a GIS to be displayed and analyzed spatially. The resulting map of significant features is displayed below.

### Significant Village Features



Results of the first data collection created a topology of significant features within the village. The rating system allowed for easy identification of problem areas. A few themes emerged from the initial data collection. Some common negative features included; lack of sewage and storm water infrastructure, exposed waste facilities, unsafe walking paths and fire risk. Some positive features included; historic buildings, significant patches of vegetation and important social areas.

Understanding the spatial distribution of features in the village allowed each group to form a strategy for smaller scale analysis of each case study area. Major problems were explored in further detail and groups were asked to document and sketch the morphology of features within each study area. Students collected morphological data by sketching features on paper maps. The field sketches were recreated in Adobe Illustrator and displayed along with notes describing the condition and quality of features. The Illustrator graphic format provided an interface between hand sketches and digital data. The digital representation of village feature morphology allows for both quantitative and qualitative spatial analysis of specific features. The Illustrator format also provided a template for student design scenarios. The students concluded the project with a presentation of design scenarios for each case study area. The designs included graphic elements, text descriptions and photo examples of existing similar features.

The next step for this project would be to form a series of indicators which identify the changes in morphologies through various development stages. The systematic definition of morphologies over time would assist in identifying significant changes or threats to the historic fabric of the village. The representation of village features using spatial technology, allows for quantifiable analysis of the changing features in the village. Morphological and qualitative data collection efforts, such as that performed by Yunnan Arts University and the University of Colorado, allow for an increased understanding of changes in the historic and cultural urban fabric of developing areas such as Chenggong County and Xiazhuang Village.

#### **4. Qualitative Analysis of Existing Village Conditions**

After the initial data collection effort was complete, results were input to a digital format and it was possible for groups to present general descriptions of each case study area. The groups combined the point feature data, morphological sketches and photo images collected during site visits to describe the positive and negative qualities of the three case study sites. Each group defined current conditions, describing the general problems and opportunities present in each case study area. These presentations provided the format and background information required to create future design scenarios that resolve existing issues at each case study location.

#### 4.1 Current condition of the market area of Xiazhuang village.



#### Existing issues in the market area of Xiazhuang village

- The market is crowded and its function division is unreasonable. (e.g. Snack stores, vegetable stores, fowl stores, fruit stores and clothing stores mix together.) **(Photo 1)**
- Overall environment is bad: trash is discarded carelessly and the smell from the open-air garbage cans is awful especially in oppressive weather. **(Photo 2)**
- The Wanfeng Temple located in the market at the entrance of Xiazhuang village is not well protected or presented. **(Photo 3)**
- The gateway design of the market has a series of problems. (e.g. It is difficult for some vehicle to pass the gateways and the signs of gateways are not obvious. The traffic flow at the connection of several market gateways and external primary roads is not free.) **(Photo 4)**
- The sewage lines are not designed reasonable and exposed. In rainy days, water will gather at the road surface which leads sewage accumulation.
- Lack of fire-extinguishing system.

- Lack of landscaping.
- Inner circulation of the market is inconvenient. (**Photo 6**)

Shown in the following photos: (**Photo 1 - Photo 6**)

**Photo 1**



**Photo 2**



**Photo 3**



**Photo 4**



**Photo 5**

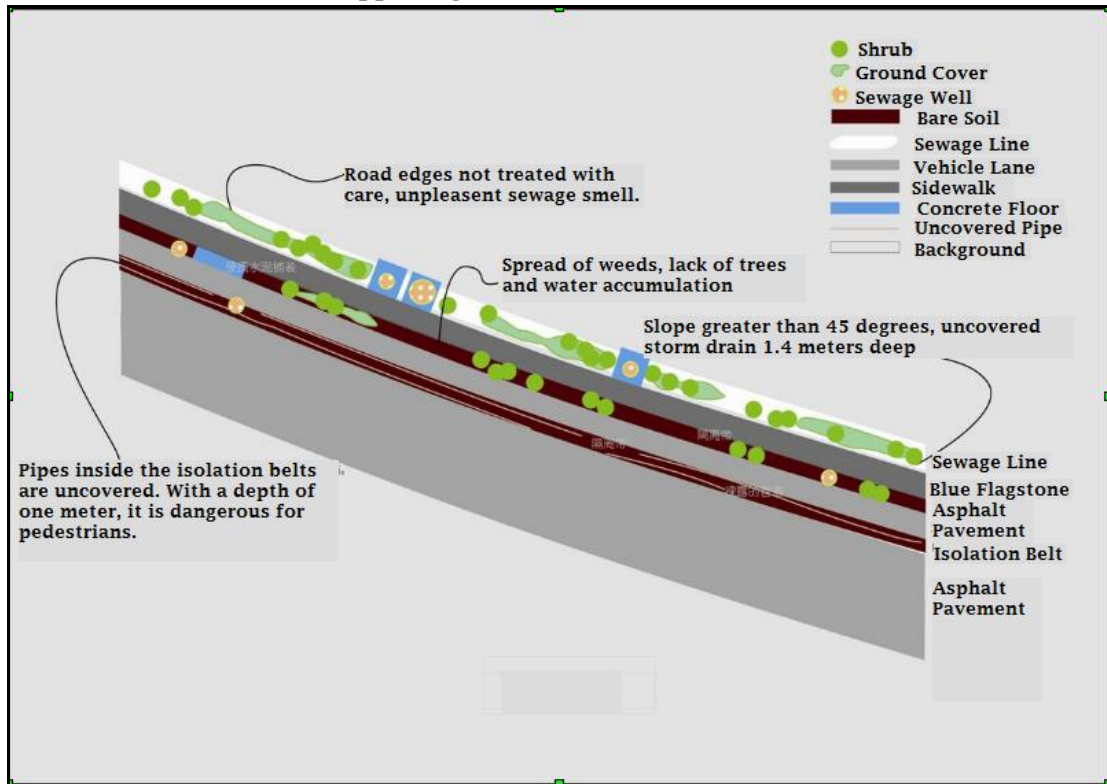


**Photo 6**

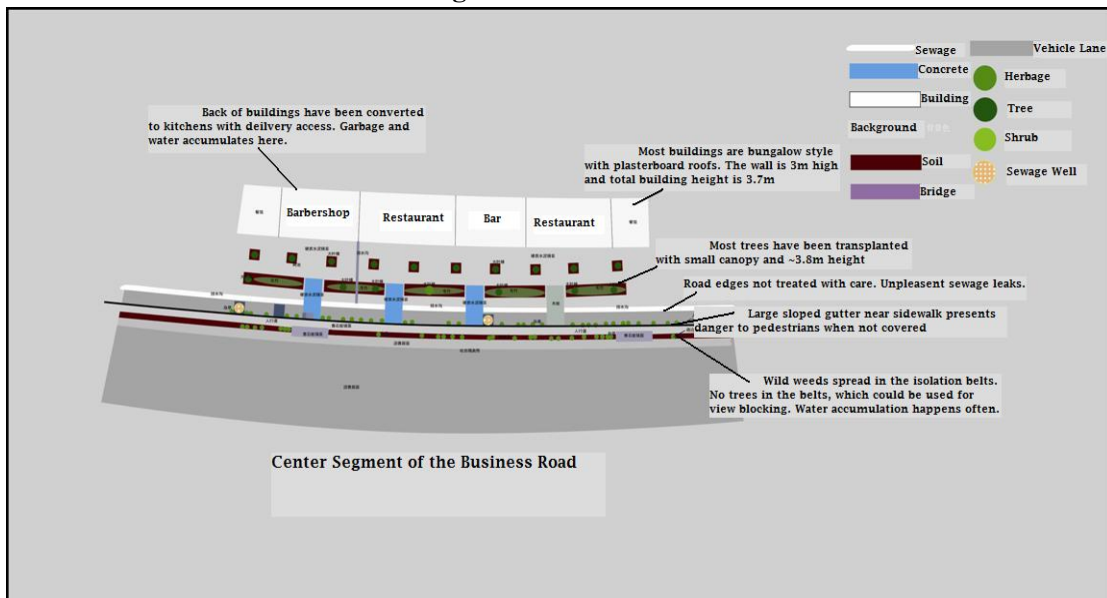


## 4.2 Current condition of the business road

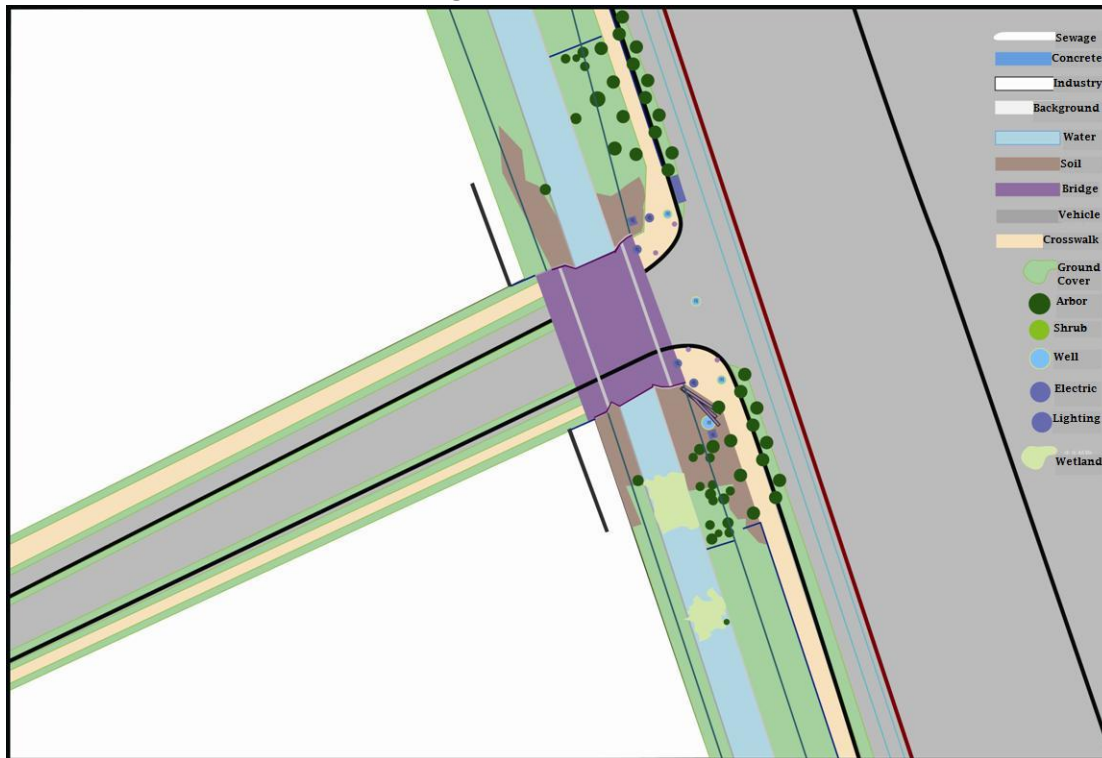
### Upper segment of the business road



### Center segment of the business road



### Lower segment of the business road



### Existing Issues of the business road

- There are seldom retail stores along the street which form a monotone street scape.
- Lack of public transportation facilities
- Lack of landscaping and exposed soil.
- Wild plants in the river channel are messy.
- Traffic segregation should be considered after the establishment of new subway stations.
- Unfinished road construction creates safety problems in public right of way
- Storm water accumulation in low-lying areas.
- “Bungalow” style buildings with public access in front and service access in the rear.
- Limited or no tree canopy

- Uneven or inconsistent topography, including steep slopes and major depressions.

Shown in the following photos: (Photo 7- Photo 14)

**Photo 7**



**Photo 8**



**Photo 9**



**Photo 10**



**Photo 11**



**Photo 12**



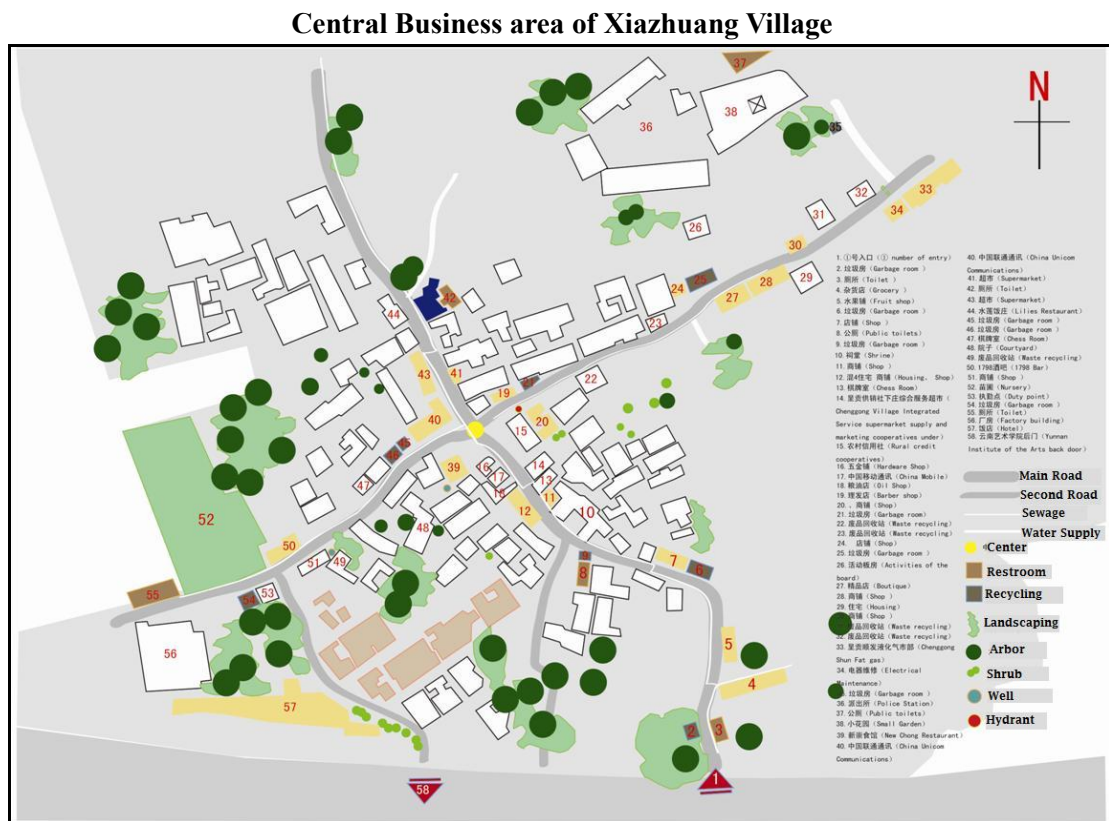
**Photo 13**



**Photo 14**



### 4.3 Current layout of the business area of Xiazhuang village



### Existing conditions of the business area of Xiazhuang village

- Both-side gutters along the street are exposed and smelly.
- Lack a overall plan: the condition of street pavement is bad and some part of the street is dirt road with accumulated water which causes inconvenience for pedestrians.
- Lack fire fighting facilities: it is unreasonable for some part of fire-fighting pipeline exposed on the earth's surface.
- Lack planning for all the telegraph poles: they are positioned unordered and at different levels which opens up security holes.
- The layout and style of trash stations are unreasonable which pollutes air and effect environment.
- Irregular buildings are obvious: some owners constructed unauthorized extensions on their buildings with portable plates which affect overall beauty and hide potential safety hazards.

- Lack of landscaping inside the village. With wild plants, current landscaping are messy and improper.
- Nearly all the restaurants along the street have potential safety hazards and strain the land.
- The location of toilets inside the village are unreasonable which affect the environment and residents' health.
- Some buildings inside the village have cracks and lack repair which are dangerous.
- Some historical buildings are unprotected, long neglected and in disrepair.

**Shown in the following photos: (Photo 15—Photo 18)**

**Photo 15**



**Photo 16**



**Photo 17**



**Photo 18**



## 5. Design Scenarios and Future Development Planning of Case Study Areas

### 5.1 Design scenario for the market area of Xiazhuang village.



#### **Future development planning of the market area in Xiazhuang village.**

- Construct a public market and small retail shops in two different zones. Inside the market, sections used for vegetables, fruits and meat should be divided clearly.
- Add trash stations and place big trash cans at densely populated regions.
- Construct a front square for the temple which could help smooth the circulation from the main entrance of the market to the main road leading to the temple.
- Build a pedestrian path in the west of the market where is close to campus entrance. Build a main road in the east of the market. Connect the front square of the temple with the village gateway. Meantime, rebuild the road connecting to the market to be a one with sidewalk.
- Scientifically analyze the terrain of the market area and design the underground

pipelines.

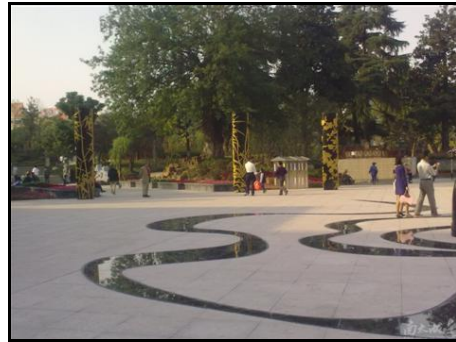
- Expand the fire passage inside the market area and add fire fighting facilities.
- Increase the landscaping at the front square of the temple and the south entrance of the market.
- Build unobstructed circulation system and parking lots according to the zone division of the market.

**Shown in the following photos: (Photo 19 - 20)**

**Photo 19**

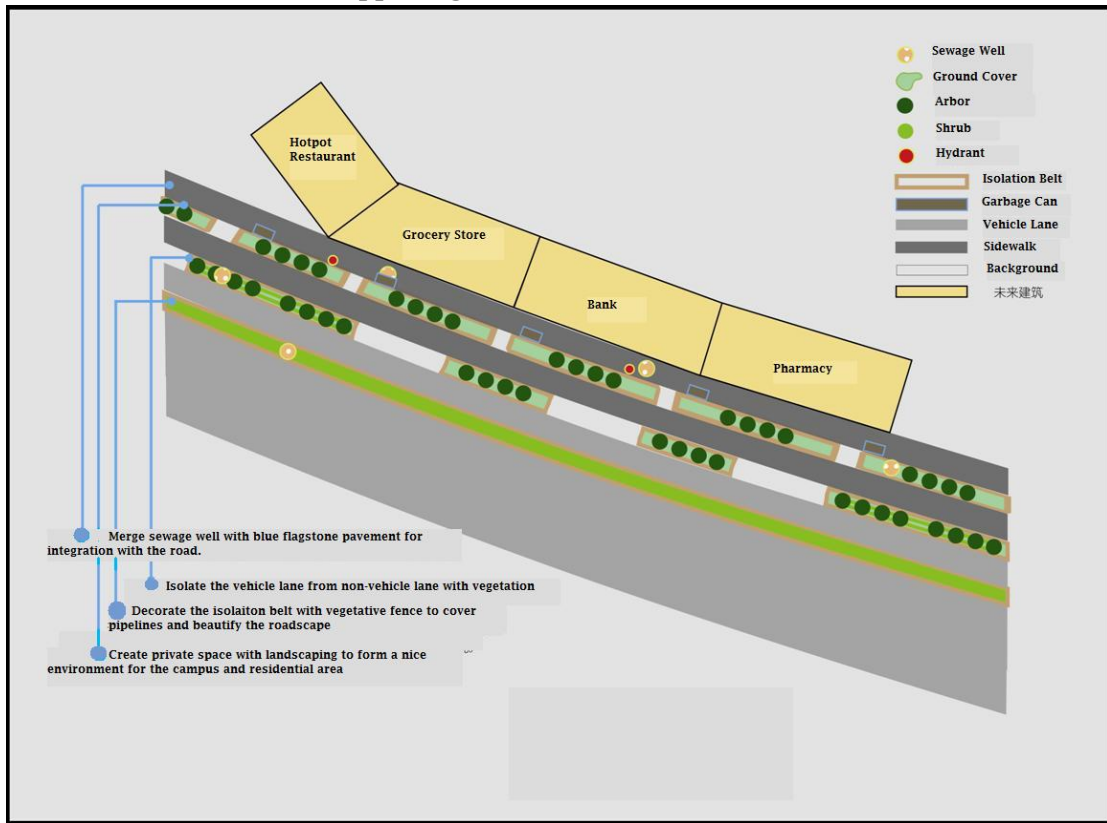


**Photo 20**

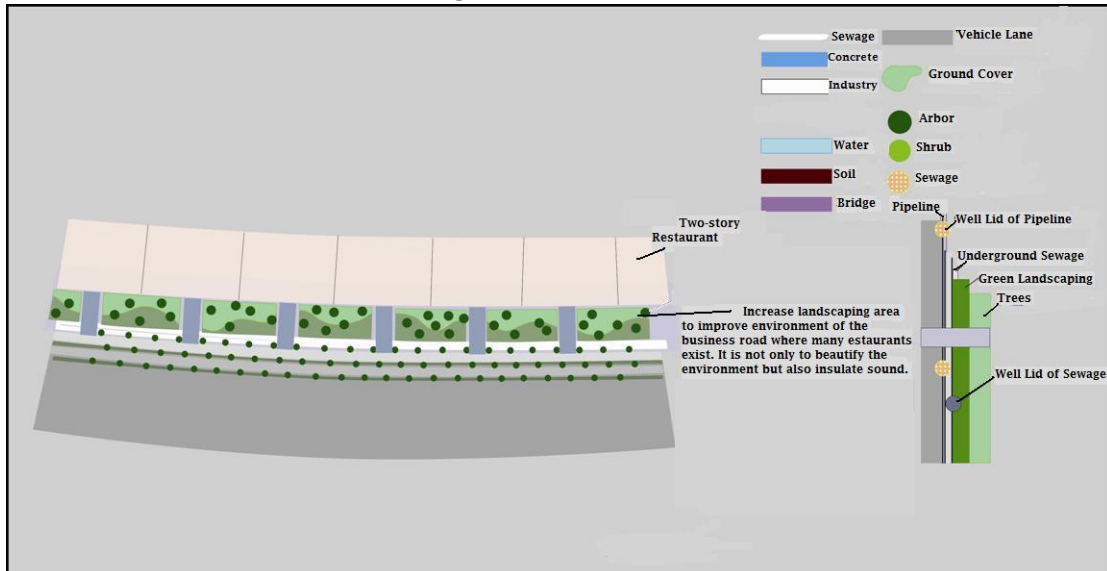


## 5.2 Design Scenario for the business road

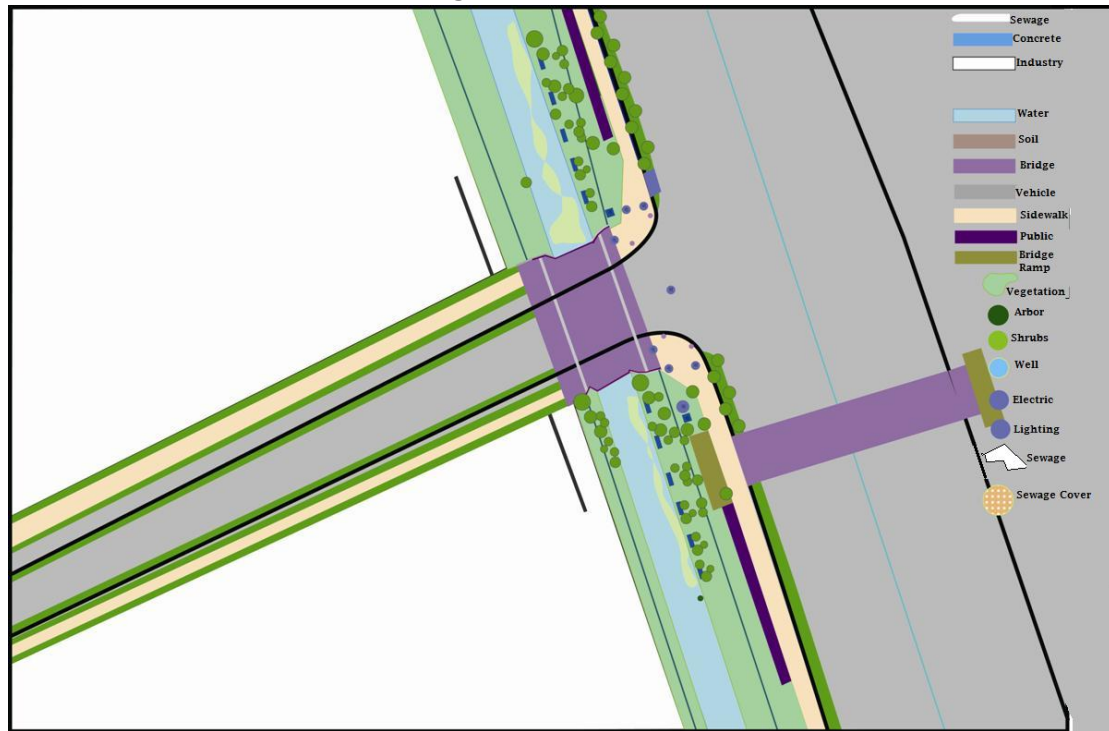
### Upper segment of the business road



### Center segment of the business road



### Lower segment of the business road



### Future development planning for the business road

- Appropriately add retail stores along the business road where traffic flow is high.
- Set bus stations at the campus entrance of Yunnan Baiyao pharmaceutical factory.
- Eliminate bare soil with landscaping when the undergoing construction is complete.
- Transplant the plants inside the river to be zonally distributed.
- Build a pedestrian overpass on the south of the bridge over the highway.
- Plant trees and grass along the business road to add beauty.
- Plant shrub and arbor for the isolation belts to divide vehicles from bicycles. Some non-planted parts of the isolation belts should be kept for passage.
- Increase landscaping area to improve environment of the business road where there are many restaurants. Standardize the restaurants, recreational places, and so on along the business road to meet the needs of students nearby and drive the development of Xiazhuang village.

- Some retail stores could be open along the street for pedestrians' convenience. Develop car-hire business to tour and visit. Beautify the riverfront landscape and create safe traffic state through special facilities.

Shown as the following photos: (Photo 21 - Photo 23)

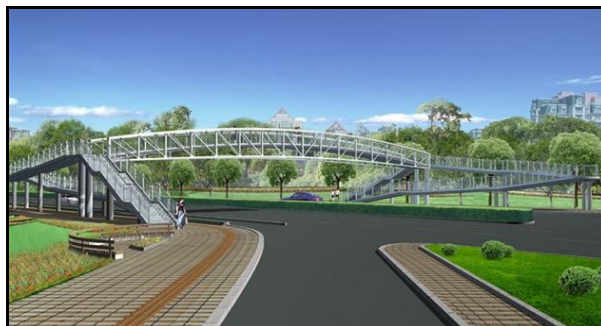
**Photo 21**



**Photo 22**



**Photo 23**



### 5.3 Design scenario for the business area of Xiazhuang village

Central Business Area of Xiazhuang Village



#### Future development planning of the business area

- Cover the street gutter to extend the width of the street as well as eliminate unpleasant odor.
- Re-plan the street system to create smooth circulation and increase regional accessibility. Separate sidewalk from road which could create comfortable environment and improve the residents' living quality.
- Add fire fighting facilities inside the village. Fix up the previous exposed fire-fighting pipelines. And cover the unchangeable part of the pipelines with landscaping.
- Make rational planning for all the cable system inside the village to remove the hidden dangers.
- Renovate the irregular buildings. Remedy or demolish the buildings with cracks. Reorganize the restaurants along the street to ensure the hygiene quality.

- Reserve the historic architecture inside the village and remedy them.
- Suitably arrange the restrooms inside the village. Landscaping their surrounding area to be pleasant and provide coverage
- Sort out the trash stations inside the village. Within a radius of convenient life, the trash stations should be classified and relocated with the population distribution.
- Appropriately replant some existing plants inside the village for added landscaping, improving the air quality, and beautifying the environment.
- For enriching the environment and meeting residents' needs, some children playgrounds and recreational body-building zones should be added. The playgrounds should have some small recreational facilities. And the body-building zones could provide residents with leisure space for jogging, public dancing, enjoying the cool in the shade, etc..

**Shown in the following photos: (Photo 24 -Photo 26)**

**Photo 24**



**Photo 25**



**Photo 26**



## 7. Summary

Based on the results of this project, it seems possible to integrate the village into the developing environment of Chenggong County without destroying the cultural significance of the village. This integration would require careful planning and a more thorough investigation of the impacts of development to the village. This high resolution analysis can be used to inform a design process aimed at providing opportunities for the village to develop and adapt to economic and social changes while preserving its significant cultural and environmental characteristics. The sustainable redevelopment of Xiazhuang Village is dependent on local and regional government policy and the changes suggested by this report are primarily exploratory in nature. Further research of this topic would include a more precise measurement of the morphology of major components of the village's urban fabric. Also, continued documentation of future developments that will change the morphology and spatial structure of these features can create a greater understanding of the evolution and modernization of historically significant areas, such as Xiazhuang Village.

This project was primarily the result of a collaboration between the University of Colorado at Denver and Yunnan Arts University. This was the first collaboration between the two universities and was intended to foster a relationship in which further collaboration projects may occur at a larger scale. The project was a valuable learning experience for both universities and in this regard, deemed a success.

Yunnan Arts University students received an introduction to a framework for sustainable planning analysis and students from the College of Architecture and Planning were introduced to planning and sustainability issues in a rapidly developing country, which utilizes a different institutional structure than the United States. The development of a relationship between both universities and the knowledge sharing that occurred throughout the project were, perhaps, the greatest outcome of this project. The entire collaboration project was completed in a brief two week period and this time constraint limited the extent of analysis that the research team was able to perform.

The successful accomplishment of this project was dependent upon the efforts of all the students and professors involved. Without clear communication and commitment by all members of the project, it would not have been possible. The time constraints significantly limited the process of investigation and analysis, however each member was able to improve professional abilities by adapting to the challenges presented. In all, the collaboration project was a successful catalyst for the development of a relationship between the University of Colorado and Yunnan Arts University. This interaction will open doors for larger and more formal collaboration projects in the future and allow for more knowledge and skill sharing between both universities.

February 2012

### **Literature Cited:**

Yao, Sheng (2012) The evolution of urban form in China: an application of M.R.G. Conzen's method in Guangzhou.

