



BLAENAVON

The Valleys that changed the World



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Table of Contents

Introduction.....	2
Historical development of Blaenavon in South East Wales	3
Blaenavon Changing Fortunes	5
Blaenavon Existing Assets, Structures and Economic Character.....	11
Blaenavon Key Stakeholders and Interest Groups	14
Blaenavon Local/Regional Development Strategies	16
Regenerating Ideas for future economic opportunities for Blaenavon.....	18
Conclusion	27
Reference.....	28
Appendices	36

Introduction

This report examines the Regeneration of a community using Blaenavon town in Pontypool, South-East Wales as a case study. This report will be appraising Blaenavon's historical development and how Blaenavon's fortunes has changed and may continue to change due to possible new economic developments. The existing assets, structures and economic character that are still there in Blaenavon will be evaluated. The Blaenavon key stakeholders and interest groups and local/regional development strategies that are available for Blaenavon will be reviewed. The paper will propose economic strategies and sustainable developments that can be established in Blaenavon thus, underpinning The Well-being of Future Generations Act (Wales) 2015.

Blaenavon in South East Wales, is known as the Valleys that changed the world, for its Industrial Revolution in Ironworks and coal mining in the 18th and 19th centuries (The Valleys, 2018). Due to its best quality iron ore, coal and limestone, these minerals were used to produce iron which started the ironworks in 1789 in Blaenavon and the coal mining 'Big Pit' in 1880 to 1980. This fuelled the Industrial Revolution that made Wales the world's first industrial nation. Blaenavon Industrial Landscape was inscribed as a World Heritage Site in 2000 by UNESCO-United Nations Educational, Scientific and Cultural Organization (UNESCO, 1992-2018; Blaenavon World Heritage Site, 2018; Birtles, 2008).

Historical development of Blaenavon in South East Wales

Blaenavon Ironworks was the catalyst for the development of the town and for its World Heritage Site status (BTCCA, 2017-2022, p8). The Blaenavon Town Centre Conservation Area covers about nineteen hectares and it was designated in 1984. There are about 26 listed buildings and one Scheduled Ancient Monument (Appendix-1). The surrounding town was recognised by UNESCO in 2000 for its historical value and as Blaenavon Industrial Landscape World Heritage Site (BILWHS). The wider landscape is also recognised by Cadw and Natural Resources Wales as a Landscape of Historic Interest (BTCCA, 2017-2022, p8).

Again, before the Ironworks started operations in 1789, Blaenavon had few farmsteads, eventually, the town grew because of the ironworks and ironworkers. This led to Broad Street developing to becoming the commercial base of the town and consequently a covered market was established in 1840 and an extensive tramroads system (BTCCA, 2017-2022, p.8).

In another development, since the nationalisation of the coal industry in 1947, the coal industry underwent many changes. Considerable investment was ploughed into the industry by the government, allowing new equipment and mining techniques to be introduced (The Miners' Strike-1984-85, 2009). Nonetheless, the cheap Middle East oil in the mid-1950s contributed to the decline of the coal industry and Blaenavon in particular, as many quarries were closed in South Wales between 1957 and 1964 (The Miners' Strike-1984-85, 2009).

The British coal industry was one of the safest and most efficient in the world but, miners were always going on strike for more pay in the 1970s to the early 1980s. Thereafter, UK Government could not keep spending to keep people employed as it was generally believed, hence, the government decision, under Margaret Thatcher (former UK Prime Minister), decided to make industry more efficient by shutting down unprofitable sites, including Blaenavon, and other former state-run

industries were privatised. In 1987, the National Coal Board (NCB) became British Coal and was privatised in 1994 (Department of Energy & Climate Change, 2014; Pandian, 2016), as the cost of operations was completely out of balance with revenue and productivity. In 1981, the government subsidised the coal industry by about £250 million due to cheap oil and cheap coal from abroad. The industry was at a point whereby the taxpayers were paying people to buy British coal as the government tried protecting the coal industry. This cost the British taxpayer over £30 million per year. One example was when Central Electricity Generating Board were banned from importing 3 million tonnes of coal (Pandian, 2016).

Blaenavon Changing Fortunes

Taylor-Davies (2018) narrated how the Ironworks started in 1787 and described the Iron making process in the furnace, which includes the heating up of limestone, coke, Iron ore in the furnace to produce pig Iron.

However, the Ironworks site used to consist of the Industrial operation, communal living and children's school. Such arrangements would not be allowed in modern times as these pose health hazards. Although most of the Ironworks site is now a dilapidated (Figure-1,2,3).

The Iron work site was designed as a multipurpose site and was planned to have more than one furnace from the beginning in 1789. Sydney Gilchrist Thomas and his cousin Percy Carlyle Gilchrist invented a method to line the Iron converter with limestone, called 'basic Bessemer process' in 1878, that allows 'the used of phosphoric ores to make bulk steel' (Wakelin, 2006; Knight, 1989). Cheap oil and Gilchrist invention that allows other countries like Germany and North America to make better steel and Iron led to the demise of the Blaenavon Ironworks and British Steel Industry. Blaenavon-Ironworks closed in 1980 (Taylor-Davies, 2018; Wakelin, 2006; Knight, 1989).

Figure-1: New Blaenavon Ironworks monument and the Restored Cast Houses and Water-Balance Tower



Sobola, 2018.



Sobola, 2018.

Figure-2: The Restored Cast Houses, Furnace and Water-Balance Tower in the Blaenavon Ironworks yard



Figure- 3: The Refurbished Stack Square Cottages in the Blaenavon Ironworks yard



Sobola, 2018.

Blaenavon was a well-established community with a thriving coal mining industry; the town continued to expand. The 2011 census revealed that Blaenavon Town has a population of 6,055 (UK Census Data, 2012; Taylor-Davies, Personal communication, 6th February 2018) nonetheless, the population reached a peak of 12,500 in 1921, but the population decreased due to economic downturn and the fall in overseas demand for coal (BTCCA, 2017– 2022, p21).

In recent times, more than £40m has been spent sprucing up the town of Blaenavon (Morris, 2008). The visitor centre, in the old schoolhouse, was designed to showcase how Blaenavon progressed from remote farming area to a driving force of the industrial revolution before its decline (Morris, 2008). Despite this, Blaenavon still has a unique industrial landscape. Accordingly, the area is an example of an area shaped by coal and iron-making development during the eighteenth and nineteenth centuries.

The Blaenavon Industrial Landscape attained the United Nations World Heritage status since 2000. The implication is that the status stimulates local plans to conserve and develop the Blaenavon

Industrial Landscape, and to promote the economic redevelopment of the town and its surroundings (Blaenavon Partnership, 2000; Jones & Munday, 2001).

During the period when the Big Pit was operational, it employed 1,500 people at its peak, this coalmine dominated and transformed economic, political cultural and Industrial activities in Wales (Coupland, 2015). But unfortunately, now that it has become a heritage site and museum, it employs only 60 people (Jenkins, Personal communication, March 20, 2018). Welsh historian Gwyn Alf Williams stated that Blaenavon and the whole South Wales valleys had suffered losses due to over reliance on coal because of economic decline due to the depression in the 1920s (Williams, 1985).

Furthermore, the political and economic struggles of the late 1970s and 1980s and the other factors alluded to above led to the closure of the mines in 1980 as part of a large program of pit closures. Blaenavon, backed by Wales Tourist Board and local councils was opened as a heritage site and museum in 1983. It was hoped it will contribute in economically regenerating the area through tourism. The Wales Tourist Board's objective was to create a working coal mine museum that can create tourism attraction, tourism employment and generate income for the residents and the site itself (Coupland, 2015).

At present, Blaenavon is drawing about 150,000 visitors annually since Big Pit was incorporated into the National Museum of Wales in 2001, and it has become flagship attraction in the Blaenavon area. Visitors to the site can explore the material remains of mining at the sites, they can take underground tours guided by ex-miners (Jenkins, 2018; Coupland, 2015).

Coupland's (2015) research revealed how gutted the miners were, when the mine gates closed, many believed the shutting down affected the community, and that it had a "knock-on effect". Beside the miners, many other people lost jobs, the whole supply chain, people who supply the overalls, helmets, the lamps, timber, the steel, machinery, transport, the machinery was affected.

The consequent unemployment has led to increased benefit claims and an increase in crime in the area figure-4,5,6 and Appendix-2,3,4. In addition, Jones & Munday (2001) claimed that Blaenavon is still one of the most economically and socially disadvantaged areas of the Wales.

Figure-4: Blaenavon Benefits & Unemployment Statistics

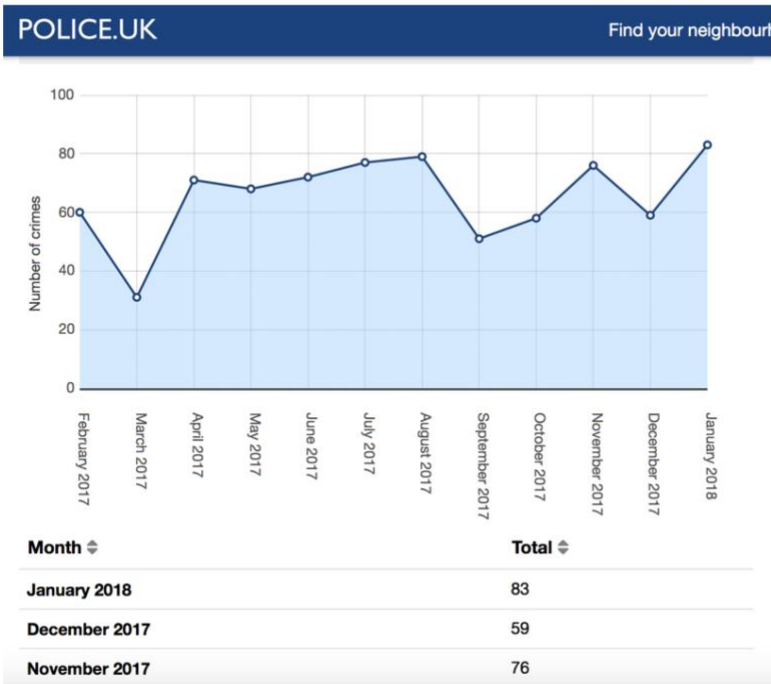
Blaenavon Benefits & Unemployment Statistics

These figures on the claiming of benefits in Blaenavon come from the Department for Work & Pensions and are dated . They can often be a good indicator of the prosperity of the town and possible indicator of how hard it would be to get employment in the area. The rate of unemployment in Blaenavon is both higher than the average for and higher than the national average, suggesting that finding a job in this area maybe hard.

BENEFIT	TORFAEN	WALES
Jobseekers Allowance (only)	4.6%	3.6%
Incapacity Benefits (IB or ESA)	3.5%	3.3%
Any Benefit (includes in work benefits)	20%	17.4%

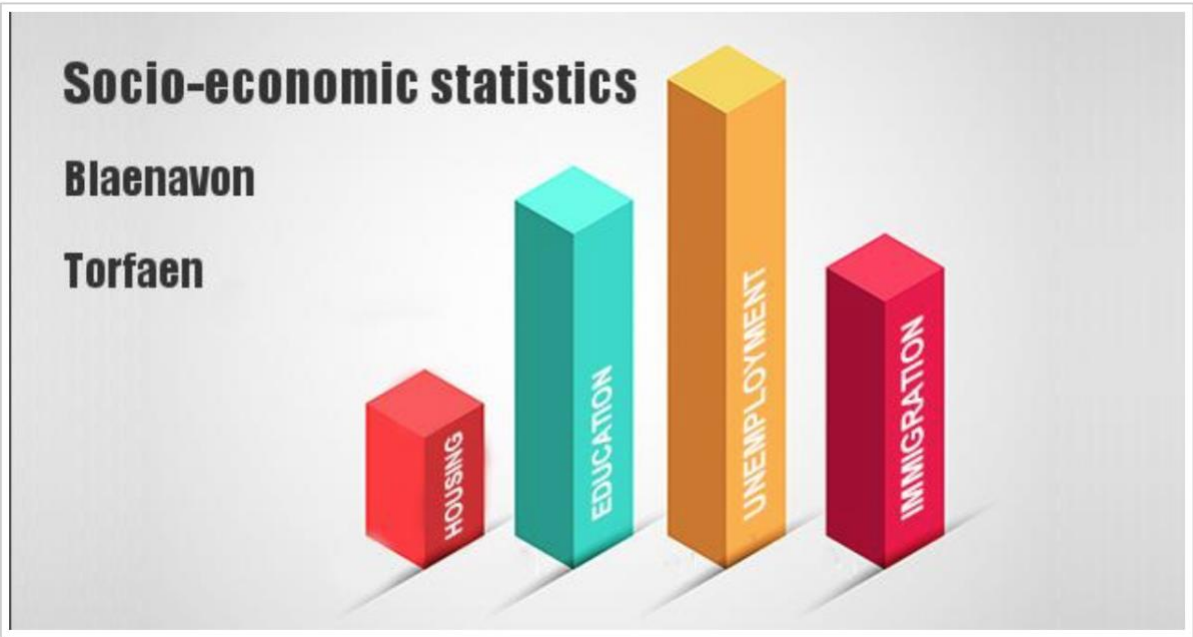
Source: iLiveHere.co.uk. (2018). Socio-economic statistics for Blaenavon, Torfaen.

Figure-5: Crime Level in Blaenavon area between February 2017 and January 2018



Source: Police.UK. (2018). Data.Police.Uk. Gwent Police. Blaenavon

Figure-6: Socio-economic statistics for Blaenavon, Torfaen



iLiveHere.co.uk. (2018). Socio-economic statistics for Blaenavon, Torfaen

Blaenavon Existing Assets, Structures and Economic Character

Taylor-Davies (2018) stated that there were 18 places of worship and 41 pubs. The St Peter's church was built in 1805 by the ironworks proprietors and the building contains many features made from cast-iron (Figure-7). It was interesting to note how a thriving community grew up and revolved around the Ironworks and during that era, religion was a big part of the community and also had crucial role to play. As work in the ironworks and the furnaces gave workers a bad taste and polluted water, it was safer to drink beer (The Valleys, 2018, p.11), which highlights why the town consist of 41 pubs.

Figure-7: St. Peters Church- Blaenavon Heritage Site, cast iron used in tombstones and church windows in St Peter's churchyard.



Sobola, 2018.

Designated Historic Assets

The Blaenavon Town Centre Conservation Area is situated within the wider Blaenavon Industrial Landscape World Heritage (WH) site inscribed by UNESCO in 2000. UNESCO recognised that –

“The area around Blaenavon bears eloquent and exceptional testimony to the pre-eminence of South Wales as the World’s major producer of iron and coal in the nineteenth century. It is a remarkably complete example of a nineteenth Century landscape”.

[Extract from ICOMOS report to the World Heritage Committee November 2000]

The Blaenavon Industrial Landscape is a cultural landscape which is endowed with evidence of extensive past coal mining and ironmaking activities during the Industrial Revolution. It provides materials of the early formative years of the Industrial Revolution which can be studied and understood. The WH site is about 33 square kilometres and the wider landscape is also registered as a Historic Landscape (BTCCA, 2017 – 2022, pp 56-60). In addition, there are 28 Listed Buildings within the BTCCA and one Scheduled Monument (Blaenavon Ironworks) such as Council Offices (Municipal Offices), Blaenavon Evangelical Church (Moriah Chapel), Group of Five Tombs in The Churchyard to South of St Peter’s Church, St Peter’s Church, Former St Peter’s Boys’ School (Now Ramfield Study Centre), The Beeches Nursing Home (Formerly Known as Ty Mawr), Cast House and Foundry; Blast Furnaces; Stack Square-Blaenavon Ironworks, Blaenavon Ironworks, Post Office, Workmen’s Hall and Institute, High Street, Gilchrist Memorial (see Appendix-1 for other listed; BTCCA, 2017 – 2022, pp 56-60).

Several local properties with historic or architectural value, group value, or visual interest are being considered for additional protection and are now included on a Local List (Appendix-5; BTCCA, 2017 – 2022, pp 61-63, 85]

Conservation Area Management Plan

Blaenavon Conservation Area includes both the historic streets around the town centre and the Blaenavon Ironworks. It is therefore imperative to protect and improve the heritage qualities for the future of the local economy and to ensure its conservation. Consequently, future regeneration of the areas must be carefully considered so as not to infringe on the retained towns landscape ((BTCCA, 2017 – 2022, pp 67-68; Appendix-6 for the SWOT)

Blaenavon Key Stakeholders and Interest Groups

After speaking with the community, ex-miners, ex-workers, you have a sense of important and passionate stakeholders. Other stakeholders include the Social services/government, NHS, environment group NGOs, UNISCO, and funding bodies. Funding Bodies according to Kathryn Jenkins (Personal communication, March 20, 2018) the Big Pit Coal Museum Communications Officer in Blaenavon are listed:

1. Heritage Lottery Fund
2. Welsh Assembly Government
3. Wales Tourist Board
4. Lloyds TSB Foundation
5. Private trusts and fund

The community see itself as the custodians of the town and rightly so, before any development or ideas are to be considered, it is put to the community to vote, and whatever they agree, stands. In fact, the community is seeking to have the oldest Council members in the Guinness book of records, this is tied ensuring that Blaenavon is further entrenched in record books (Fiander-Woodhouse, 2018).

In 2004 Big Pit was re-launched following a £7 million redevelopment project with the above funding bodies that are other stakeholders. The main objectives of the redevelopment were to:

1. Give public access to collective
2. Be the Home of the national coal mining collections
3. Authenticity as working colliery
4. Create a world class museum

5. Present the objects in their human and Industrial context
6. Tell the story of the 'people of coal'.
7. Interpret the political and economic issues from varying viewpoints.
8. In 2005 Big Pit won the Gulbenkian Prize for Museum of the Year.

Other stakeholders include businesses operating in Blaenavon. The businesses operating in Blaenavon includes a Civil engineering firm, a Construction firm, IT, a Cheese making, Brewery company and the remaining list in Appendix-7. Due to the heritage status, the area has a butcher, a thriving cafe, an acclaimed specialist cheese shop, the Blaenavon Cheddar Company, which matures its cheese 300ft underground in Big Pit (Morris, 2008).

Susan Fiander-Woodhouse (Personal communication, March 20, 2018) who runs the cheese shop said: "Having world heritage status has made a huge difference. People thought we were mad when we opened this shop. But we are thriving."

Blaenavon Local/Regional Development Strategies

The Blaenavon World Heritage Centre (WHC) incorporates the former St Peter's school building, which was built in 1816 by an ironmaster's sister, Sarah Hopkins, to educate ironworker's children (Wakelin, 2006). The incorporation of the primary school into the Blaenavon WHC is a sustainable move because it is a place of reference, it has historical and educational value (Blaenavon World Heritage Site, 2017).

In addition, the Blaenavon WHC house Blaenavon library and a museum including a café, reception area, exhibition space and art gallery that overlook the nearby Coity Mountain (Birtles, 2008). Videos of the Historical place is available, there are interactive maps and timeline galleries revealing the key role each attraction played in the industrial revolution. (Figure-8,9,10).

Figure-8: Inside the Blaenavon World Heritage Centre Exhibition Space and Art Gallery.



Sobola, 2018.

Figure-9: Inside the Blaenavon World Heritage Centre Exhibition Space and Art Gallery.



Sobola, 2018

Figure-10: Inside the Blaenavon World Heritage Centre Exhibition Space and Art Gallery.



Sobola, 2018.

Regenerating Ideas for future economic opportunities for Blaenavon

Many authors defined Regeneration as policy interventions that are seeking to bring an improvement to a geographical location that was in decline by the introduction of a combination of economic, physical, social and environmental strategies (Roberts and Sykes, 2000; Jones and Evans, 2008; Crisp, Gore, Pearson, Tyler, Clapham, Muir, & Robertson, 2014). Nonetheless, it has been suggested that jobs created are always taken up by people that reside outside target areas (Crisp et al, 2014). Again, Crisp et al, (2014) suggested that although the intervention may increase an individual's chances of getting employed, but it always failed in tackling the overall levels of worklessness within deprived areas (Crisp et al, 2014). Notwithstanding, efforts to regenerate this historical area cannot be ignored.

The First regeneration idea proposed is that a Virtual Reality (VR) Centre should be incorporated into the Blaenavon World Heritage Centre. The VR can be incorporated into the Blaenavon World Heritage Centre, that is, turning Blaenavon Museum, Big Pit National Coal Museum and Blaenavon Town into a digital Virtual Reality.

Virtual Reality (VR) is a computer-generated scenario that simulates a realistic experience. The immersive environment can be similar to the real world in order to create a lifelike experience grounded in reality or sci-fi. Furthermore, the person becomes part of this virtual world can interact, explore and can manipulate objects or perform a series of actions (Virtual Reality Society, 2017).

The VR will be in line with promoting and protecting Blaenavon Heritage and history in attaining the goal of The Well-being of Future Generations Act (Wales) 2015, that is

‘A Wales of vibrant culture and thriving Welsh language’ which is ‘Wellbeing goal focuses on ‘a society that promotes and protects culture, heritage and the Welsh language, and which

encourages people to participate in the arts, sports and recreation' (Welsh Government, 2015).

BTCCA (2017-2022) claimed that the Well-being of Future Generations Act (Wales) 2015, places a duty on public bodies to

'improve the economic, social, environmental and cultural well-being of Wales in accordance with the sustainable development principle that the needs of the present are met without compromising the ability of future generations to meet their own needs' (p, 9).

BTCCA (2017, p, 9) proposed that the sustainable management of the historic environment is central to Wales' culture and character. It provides a shared sense of place and cultural identity. Therefore, the historic environment is valued, protected, actively managed and made available to present and future generations.

Blaenavon's existing physical environment can be adapted through VR headsets to view how Blaenavon was in the 18th- 19th century. VR is now used in most tourism places around the world, such as "Dolphin Dive" off the coast of Pembrokeshire and "Flight of the kingfisher" (Wildlife Trust of South & West Wales, 2018a, 1018b; Gidley, 2017). The VR will enable visitors to experience various destinations and attractions from the comfortable sitting area in Big Pit, Blaenavon museum and the Blaenavon world heritage centre,

These programmes could create jobs for the young men and women of the town. They could be enrolled in computer courses and Virtual Reality literacy, so as to gain work in this new Virtual Reality Centre. This will be a departure from the old system whereby most new business ventures in Blaenavon did not benefit the local residents. Kathryn Jenkins, the Communications Officer of Big Pit Coal Museum, Blaenavon, said that out of their 60 full-time and part-time employed in Big Pit, only 2 employees originally worked in Big Pit and only 12 employees in Big Pit currently live within Blaenavon town itself. (K. Jenkins, Personal communication, March 20, 2018). The Economy Secretary, Ken Skates declared that "When trying to entice someone to Wales and selling the concept of what a holiday in

Wales could be like, virtual reality is a perfect way of bringing those possible experiences to life - and giving a glimpse of what Wales has to offer " (Gidley, 2017).

Therefore, this new venture will be beneficial to the local economy and impactful in gaining employment that will be sustainable, affecting the economic, social and cultural growth and see Appendix-8 for detailed lists of VR benefits to the local economic.

The Second regeneration idea proposed is to build a connection Tramline/Trail-line for a Land Tram/Train, by incorporating the use of Blaenavon Heritage Railway to commute visitor through all the Blaenavon World Heritage Site Places of Interest, such as the Big Pit National Coal Museum – Ironwork – Town Centre–Up on the hills–Down the valleys–going through all the parking site in the town – going through the Blaenavon Conservatives forest-to the Monmouthshire and Brecon Canal-down to the Keeper's Pond and back (figure-11,12,13) . This can be done by Reusing the Abandoned Transportation Infrastructure (Figure-11,13). Example of this is used in a former working link between the lead mines of the Rheidol Valley and Aberystwyth's harbour. The Vale of Rheidol Railway now runs a steam train service through Aberystwyth – the Rheidol Valley to Devil's Bridge for visitors and sightseers (Aberystwyth.org.uk, 2018).

This idea might be difficult to execute because of the Heritage status of the town.

During interviews on both visits (08/02/2018 & 20/03/2018) the general consensus was the local people want Blaenavon to remain the way it was, and they do not want anything done to change their heritage, but at same time, they want a large percentage of visitors visiting the Big Pit and Ironwork to come into the town. Therefore, a passenger rail/tram carrying visitors from one area to the other would be welcome. Over 150,000 visitors visit Big Pit yearly if fifty percent makes the journey into the town itself, it would boost local economy. The Tram/Train can also be used by the community to

commute children to their school which will reduce the carbon footprint of cars used by parent to commute their children to school and can be used by the elderly to commute around the town.

This was a welcome idea by the local residents' and Big Pit workers that were interviewed (Appendix-9) such as Mark Jones, John Scandrewtti, Mark Thomas, David Trapnell; June Matthews, Kahe Rowles, Heather Williams, Susan Fiander-Woodhouse and Ashley Parry agreed with this idea (Jones, 2018; Scandrewtti, 2018; Thomas, 2018; Trapnell, 2018; Matthews, 2018; Rowles, 2018; Williams, 2018; Fiander-Woodhouse, 2018; Parry, 2018, All were Personal communication, March 20, 2018).

Figure-11: Blaenavon World Heritage Site Places of Interest / Railway / Iron Mountain Trail.



Adapted from Blaenavon World Heritage Site Leaflet 2018a; Sobola, 2018.

Figure-12: Blaenavon World Town and Places of Interest



Adapted from Blaenavon World Heritage Site Leaflet 2018b; Sobola, 2018.

Figure-13: Blaenavon World Heritage Site and Places of Interest with Iron Mountain Trail



Adapted from Blaenavon World Heritage Site Leaflet, 2018b; Sobola, 2018.

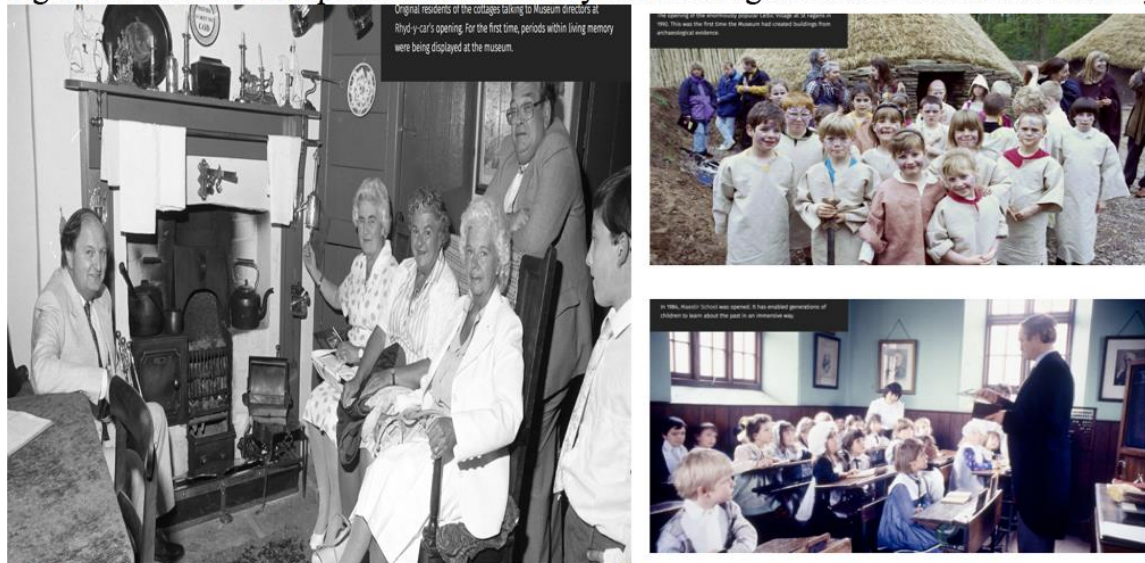
The third regeneration idea is to Convert the Beeches Nursing Home (formerly known as 'Ty Mawr'; Figure-14), and the Refurbished Stack Square and Engine Row Cottages in the Blaenavon Ironworks yard into a retreat 'Heritage Hotel & Breakfast' for visitors/Tourist. This holiday home will allow people to experience and live the lifestyle as those who lived there 200 years ago. This idea is like the Retreat experience in the countryside and at that era, such as St Fagan's (figure-15; St Fagans National Museum of History, 2018).

Figure 14: The Beeches Nursing Home (formerly known as 'Ty Mawr')



Sobola, 2018.

Figure 15: The Retreat experience in the countryside in St Fagans National Museum of History



St Fagans National Museum of History, 2018.

The last idea is to build a Shopping Centre out-from-main-street for exclusive big brands like the Kildare Outlets shopping mall in Kildare town, Ireland (Kildare Village, 2018). A site close to the Gilchrist Thomas Industrial Estate is proposed for shopping Centre as this will not interfere with the heritage site and the conservation area within the town centre and the interviewees with residents such as June Matthews, Kahe Rowles, Heather Williams, Susan Fiander-Woodhouse and Ashley Parry agreed with this idea (J. Matthews (2018); K. Rowles (2018); H. Williams (2018); S. Fiander-Woodhouse

(2018); A. Parry (2018). All were Personal communication, March 20, 2018). Nonetheless, some community members still have reservations about the effect of such a shopping mall on the existing businesses in the town centre. Figure-16 details other ideas that could be explored.

Figure-16: Details other Ideas that could be Explored

1. Using abandon buildings in Blaenavon for office, suggestions that the Wales Government should move or open some of their main offices in Blaenavon to keep and provide jobs/employments and increase population living in the town, which also have a direct effect on the housing by increasing housing all this will create local employment and build the economic.
2. Reusing the Abandoned Railway Transportation Infrastructure (Figure-11,13). By turning it into a park with an integrated system of concrete pathways, seating areas and special features blend with naturalistic planting areas to create singularly sensational landscape. This system was done is in New York when 'The High Line' in New York a one mile stretches of abandoned elevated railroad on New York's West Side (New York City Economic Development Corporation (NYCEDC), 2018)
3. Concerts- like the Glastonbury festival
4. Educational Retreat
5. Using the funding tie in the inspire- regeneration
6. Research village- Can be used for Research Centre like the Port Talbot
7. By transforming these sites creatively repurposes existing structures, and creating new amenities that promote recreation and community, including a deep diving pool, a rock climbing wall, picnicking areas, hiking trails, and multiple performance spaces—all woven

together to create tapestry of memorable places. The aim was to change the industrial landscape with minimal intervention, recycling and visually renewing decaying architectural objects into poetic places that pay homage to the site's past (Inhabitat.com. (2017), just as the design made by Latz & Partners in the Reuse & Reclamation: Post-Industrial Factory Landscape. Landscape Park Duisburg Nord in Duisburg, Germany (Inhabitat.com. (2017).

The implementation of any of the economic regeneration ideas will reduce Blaenavon's unemployment figure, reduce crime and improve the wellbeing of the people. (figure-4; iLiveHere.co.uk, 2018; Police.UK. 2018; figure-5 above).

Conclusion

Blaenavon has played a crucial role in world industrial revolution. Blaenavon still has a unique industrial landscape, which is an example of an area shaped by coal and iron-making development during the eighteenth and nineteenth centuries. By using Virtual Reality experience in most places in Blaenavon, this will leave a lasting impression of the place. The virtual reality could be a creative way of giving a hint of what Wales has to offer. Therefore, all the above ideas underpin the future economic opportunities/strategies and sustainable developments that can be in Blaenavon and this fulfils the Well-being of Future Generations Act (Wales) 2015. The ideas will generate employment, create economic activities, reduce crime, improve infrastructure, and the Heritage centre will not be a burden on the town, but it will continue to be a place of pride and inspiration for generations to come.

Reference

Aberystwyth.org.uk. (2018). Vale of Rheidol Railway. Retrieved from

<https://www.aberystwyth.org.uk/attractions/vale-of-rheidol.shtml>

Birtles, J. (2008). The Things I Know. Planning (14672073), (1785), 23.

Blaenavon Community Museum. (n.d.). Blaenavon Community Museum and Blaenavon Workmen's Hall. [Leaflet obtained in Blaenavon Community Museum], 6th February 2018.

Blaenavon Conservation Area Appraisal and Management Plan. (2017). Retrieved from

<https://www.torfaen.gov.uk/en/Related-Documents/Forward-Planning/Blaenavon-Conservation-Area-Appraisal-and-Management-Plan.pdf>

Blaenavon Partnership. (2000). Management Plan for the Nominated World Heritage Site of Blaenavon Industrial Landscape. Torfaen County Borough Council, Torfaen.

Blaenavon World Heritage Site. (2017). Welcome to the Blaenavon World Heritage Site. [Leaflet obtained in Blaenavon World Heritage Centre], 6th February 2018.

Blaenavon World Heritage Site. (2017). Welcome to the Blaenavon World Heritage Site. [Leaflet obtained in Blaenavon World Heritage Centre], 6th February 2018.

Blaenavon World Heritage Site. (2018). Blaenavon Ironworks. Retrieved from

<http://www.visitblaenavon.co.uk/en/VisitBlaenavon/ThingsToDo/BlaenavonIronworks.aspx>

Blaenavon World Heritage Site. [Leaflet] (2018a). Blaenavon Heritage Site and Big Pit National Coal Museum. [Leaflet obtained in Blaenavon World Heritage Centre], 6th February 2018.

Blaenavon World Heritage Site. [Leaflet] (2018b). Blaenavon Heritage Town and Blaenavon Places of Interest. [Leaflet obtained in Blaenavon World Heritage Centre], 6th February 2018.

BTCCA- TCBC. (2017). Blaenavon Town Centre Townscape Heritage Programme Conservation Area Appraisal and Management Plan 2017-2022. Appraisal & Management Plan. Retrieved from <https://www.torfaen.gov.uk/en/Related-Documents/Forward-Planning/Blaenavon-Conservation-Area-Appraisal-and-Management-Plan.pdf>

Cadw, Welsh Government. (2016). Blaenavon Ironworks: *The ironworks were at the cutting-edge of new technology*. Retrieved from <http://cadw.gov.wales/daysout/blaenavonironworks/?lang=en>

Coupland, Bethan. (2015). *Remembering Blaenavon: What Can Group Interviews Tell Us about "Collective Memory"?* (Vol. 42).

Crisp, R., Gore, T., Pearson, S., Tyler, P., Clapham, D., Jenny Muir, J. and Robertson, D. (2014). Regeneration and Poverty: Evidence and Policy Review. Retrieved from <http://www4.shu.ac.uk/research/cresr/sites/shu.ac.uk/files/jrf-regeneration-poverty-final-report.pdf>

Department of Energy & Climate Change. (2014). British Coal Corporation Appraisal Report 2013. Retrieved from <https://www.nationalarchives.gov.uk/documents/information-management/british-coal-corporation-appraisal-report.pdf>

Europa Park. (2018). Europa Park Theme Park and Resort. Retrieved from <https://www.europapark.de/en>

Exploring Blaenavon Industrial Landscape, World Heritage Site (Book). (2004). Industrial Archaeology Review, 26(1), 73-74.

Fawr, R. (2018). Big Pit National Coal Museum guides. [Personal communication], 6th February 2018.

Fiander-Woodhouse, S. (2018). Blaenafon Cheddar Company. Interview with Susan Fiander-Woodhouse – Owner of Blaenafon Cheddar Company and Blaenavon Local Resident

[Interview/Personal communication]. Interviewed by Oluwayemisi Sobola [student, UWTSD Business and Management], 20^h March 2018.

Gidley. S. (2017, 22 October). BBC News - Virtual reality: Tourism firms use VR to attract visitors.

Retrieved from <http://www.bbc.co.uk/news/uk-wales-41635746>

iLiveHere.co.uk. (2018). Socio-economic statistics for Blaenavon, Torfaen. Retrieved from

<https://www.ilivehere.co.uk/statistics-blaenavon-torfaen-4029.html>

Inhabitat.com. (2017, 01 January). '10 landscape design projects that turned neglected spaces into

incredible parks'. Reuse & Reclamation: Post-Industrial Factory Landscape. Landscape Park

Duisburg Nord in Duisburg, Germany. (Designer: Latz + Partners). [weblog post]. Retrieved

from [https://inhabitat.com/10-landscape-design-projects-that-turn-damaged-and-](https://inhabitat.com/10-landscape-design-projects-that-turn-damaged-and-neglected-spaces-into-healthy-beautiful-environments/)

[neglected-spaces-into-healthy-beautiful-environments/](https://inhabitat.com/10-landscape-design-projects-that-turn-damaged-and-neglected-spaces-into-healthy-beautiful-environments/)

Jenkins, K. (2018). Big Pit National Coal Museum . Interview with Kathryn Jenkins – Big Pit

Communications Officer [Interview/Personal communication]. Interviewed by Oluwayemisi

Sobola [student, UWTSD Business and Management], 20^h March 2018.

Jones, C., & Munday, M. (2001). Blaenavon and United Nations World Heritage Site status: Is

conservation of industrial heritage a road to local economic development?. *Regional Studies*,

35(6), 585-590.

Jones, M. (2018). Big Pit National Coal Museum . Interview with Mark Jones – Ex-miners and Big Pit

tour Guide [Interview/Personal communication]. Interviewed by Oluwayemisi Sobola

[student, UWTSD Business and Management], 20^h March 2018.

Jones, P. and Evans, J. (2008) *Urban Regeneration in the UK: Theory and Practice*. London: Sage

Publications.

Kildare Village. (2018). Kildare Village is one of the Collection of nine of The Bicester Village Shopping Collection Villages by Value Retail. Retrieved from.

<https://www.kildarevillage.com/en/home/>,

<https://www.kildarevillage.com/en/footer/company/about-us/>

Knight, J. (1989). Blaenavon ironworks: A bicentennial guide. Cardiff: Cadw: Welsh Historic Monuments.

MacDonald. B. (2015, 15 Dec). Virtual reality rides set to invade theme parks in 2016. Retrieved from <http://www.latimes.com/travel/themeparks/la-trb-vr-coasters-virtual-reality-rides-20151215-story.html>

Matthews, J. (2018). Blaenavon Community Museum. Interview with June Matthews – Volunteer worker and Blaenavon Local Resident [Interview/Personal communication]. Interviewed by Oluwayemisi Sobola [student, UWTSB Business and Management], 20th March 2018.

Morris, S. (2008 March 26). Guardian News Article - Blaenavon World Heritage Site. *Forget the Taj Mahal and pyramids: Blaenavon is the place to visit*. Retrieved from <https://www.theguardian.com/artanddesign/2008/mar/26/heritage.art>

New York City Economic Development Corporation (NYCEDC). (2018). The High Line. Retrieved from <https://www.nycedc.com/project/high-line>

Pandian D. C. (2016 Jun 26).Quora.com. (2018). Thatcherite, Was Margaret Thatcher's decision to shut down the majority of Britain's coal mines in 1984 on the grounds that they were not economically sound a good one, particularly given today's price of coal? Retrieved from <https://www.quora.com/topic/Margaret-Thatcher-former-British-Prime-Minister>. Updated Jun 26, 2016, <https://www.quora.com/Was-Margaret-Thatchers-decision-to-shut-down-the-majority-of-Britains-coal-mines-in-1984-on-the-grounds-that-they-were-not-economically-sound-a-good-one-particularly-given-todays-price-of-coal?share=1>

- Parry, A. (2018). Big Pit National Coal Museum Shop . Interview with Ashley Parry – Big Pit Receptionist/Gift Shop Worker and Blaenavon Local Resident [Interview/Personal communication]. Interviewed by Oluwayemisi Sobola [student, UWTSD Business and Management], 20th March 2018.
- Police.UK. (2018). Data.Police.Uk. Gwent Police. Blaenavon. Retrieved from <https://www.police.uk/gwent/TP87/crime/stats/>
- Probert, G. (2018). The Blaenavon Workmen's Hall volunteer guides. [Personal communication], 6th February 2018.
- Quora.com. (2018). Was Margaret Thatcher's decision to shut down the majority of Britain's coal mines in 1984 on the grounds that they were not economically sound a good one, particularly given today's price of coal? Retrieved from <https://www.quora.com/topic/Margaret-Thatcher-former-British-Prime-Minister>. Updated Jun 26, 2016, <https://www.quora.com/Was-Margaret-Thatchers-decision-to-shut-down-the-majority-of-Britains-coal-mines-in-1984-on-the-grounds-that-they-were-not-economically-sound-a-good-one-particularly-given-todays-price-of-coal?share=1>
- Regional Tourism Engagement Fund(RTEF) 2017-2019 Projects Recommended for Funding. Retrieved from https://businesswales.gov.wales/tourism/sites/tourism/files/documents/RTEF_Projects_Recommended_for_Funding_2017-2019_-_EN.pdf
- Revolutionary. (n.d.). Blaenavon Ironworks; Tretower Court & Castle; White Castle. [Leaflet obtained in Blaenavon World Heritage Centre], 6th February 2018.
- Roberts, P. and Sykes, H. (2000). *Urban regeneration: A handbook*. London: SAGE.

Rowles, K. (2018). Blaenavon Chip Shop. Interview with Kahe Rowles – Blaenavon Local Resident and Chip Shop Worker [Interview/Personal communication]. Interviewed by Oluwayemisi Sobola [student, UWTSD Business and Management], 20th March 2018.

Scandrewtti, J. (2018). Big Pit National Coal Museum guides. [Personal communication], 6th February 2018.

Simply Seerah. (2015) "The History of Makkah." Islamic Stories in 3D (Regular Version). Retrieved from <https://www.youtube.com/watch?v=6htVBB0Vrro>

Sobola, O. (2018). Blaenavon Industrial Landscape, World Heritage Site, Blaenavon Ironworks and Bit Pit [Photo album].

St Fagans National Museum of History. (2018). History of St Fagans. Retrieved from <https://museum.wales/stfagans/>; <https://museum.wales/stfagans/about/>; <https://museum.wales/stfagans/stfagans-history/>

Taylor-Davies, R. (2018), A Specialist in Industrial Heritage and Regeneration Wales. [Personal communication], 6th February 2018.

The Miners' Strike - 1984-85 (2009, September 23). Pickets, Police and Politics: The Miners' Strike 1984-1985. Retrieved from <https://museum.wales/articles/2009-09-23/The-Miners-Strike---1984-85/>

The Valleys. (2018). The Valleys: Heart and Soul of Wales. Legendary Adventures in the Valleys. *The Valleys that changed the World*. [Leaflet obtained in Big Pit National Coal Museum], 6th February 2018.

Thomas, M. (2018). Big Pit National Coal Museum. Interview with Mark Thomas – Ex-miner and Big Pit Head Baths Exhibition Tour-Guide [Interview/Personal communication]. Interviewed by Oluwayemisi Sobola [student, UWTSD Business and Management], 20th March 2018.

Trapnell, D. (2018). Big Pit National Coal Museum. Interview with David Trapnell – Ex-miner and Big PIT Gallery Tour-Guide [Interview/Personal communication]. Interviewed by Oluwayemisi Sobola [student, UWTSD Business and Management], 20th March 2018.

UK Census Data. (2012). England and Wales, Torfaen, Blaenavon. Retrieved from <http://www.ukcensusdata.com/blaenavon-w05000768#sthash.1XWPDzOw.dpbs>

UNESCO-United Nations Educational, Scientific and Cultural Organization. (1992-2018). World Heritage Centre, World Heritage List. *Blaenavon Industrial Landscape*. Retrieved from <http://whc.unesco.org/en/list/984/>

Virtual Reality Society (2017). What is Virtual Reality? Retrieved from <https://www.vrs.org.uk/virtual-reality/what-is-virtual-reality.html>

Wakelin, P. (2012). Blaenavon Ironworks and World Heritage Landscape. Cadw Welsh Historic Monuments.

Walker, D. (2011). Towards a Beneficial World Heritage: Community Involvement in the Blaenavon Industrial Landscape. *Museum International*, 63(1/2), 25-33. doi:10.1111/j.1468-0033.2012.01760.x.

Walker, Dominic. (2011). *Towards a Beneficial World Heritage: Community Involvement in the Blaenavon Industrial Landscape*. (Vol. 63).

Welsh Government. (2015). Well-being of Future Generations (Wales) Act 2015 The Essentials (2nd edn.). Retrieved from <http://gov.wales/docs/dsjlg/publications/150623-guide-to-the-fg-act-en.pdf>

Wildlife Trust of South & West Wales. (2018a). Dolphin Dive 360 Wildlife Adventure. Retrieved from <https://www.welshwildlife.org/adventures/dolphin-dive-360-wildlife-adventure/>

Wildlife Trust of South & West Wales. (2018b). Flight of the Kingfisher 360 Wildlife Adventure.

Retrieved from <https://www.welshwildlife.org/adventures/flight-kingfisher-360-wildlife-adventure/>

Williams, G. A. (1985). *When Was Wales*. London: Penguin.

Williams, H. (2018). Big Pit National Coal Museum . Interview with Heather Williams – Big Pit Receptionist and Gift Shop Worker and Blaenavon Local Resident [Interview/Personal communication]. Interviewed by Oluwayemisi Sobola [student, UWTSD Business and Management], 20^h March 2018.

Wood, C. (2018). The Blaenavon Workmen's Hall volunteer guides. [Personal communication], 6th February 2018.

Appendices

Appendix 1

Listed Buildings (BTCCA, 2017 – 2022, pp 56-60).

1. Council Offices (Municipal Offices), Lion Street
2. Bethlehem Congregational Church (Also Known as Bethlehem Independent Chapel), Broad Street (W Side)
3. Blaenavon Evangelical Church (Moriah Chapel), Broad Street (E Side)
4. Former School-Room to Rear, Broad Street (E Side)
5. No 15, Broad Street (W Side)
6. No 16, Broad Street (W Side)
7. No 17, Broad Street (W Side)
8. No 18, Broad Street (W Side)
9. No 19, Broad Street (W Side)
10. Group of Five Tombs in The Churchyard to South of St Peter's Church, Church Road (SW Side)
11. St Peter's Church
12. Former St Peter's School (Original School)
13. Former St Peter's Boys' School (Now Ramfield Study Centre), Church Road (SW Side)
14. The Beeches Nursing Home Formerly Known as Ty Mawr)
15. Storage Shed and Attached Chimney, Blaenavon Ironworks
16. Pay Office, Blaenavon Ironworks
17. Cast House and Foundry, Blaenavon Ironworks
18. Stack Square, Blaenavon Ironworks

19. Blast Furnaces, Blaenavon Ironworks
20. Calcining Kilns, Blaenavon Ironworks
21. Chain Store, Blaenavon Ironworks
22. Balance Tower, Blaenavon Ironworks
23. Post Office, Prince Street (W Side)
24. Workmen's Hall and Institute, High Street (W Side)
25. Horeb Baptist Church, Church Road (Ne Side)
26. War Memorial, Church Road (Ne Side)
27. Gilchrist Memorial, Blaenavon Ironworks

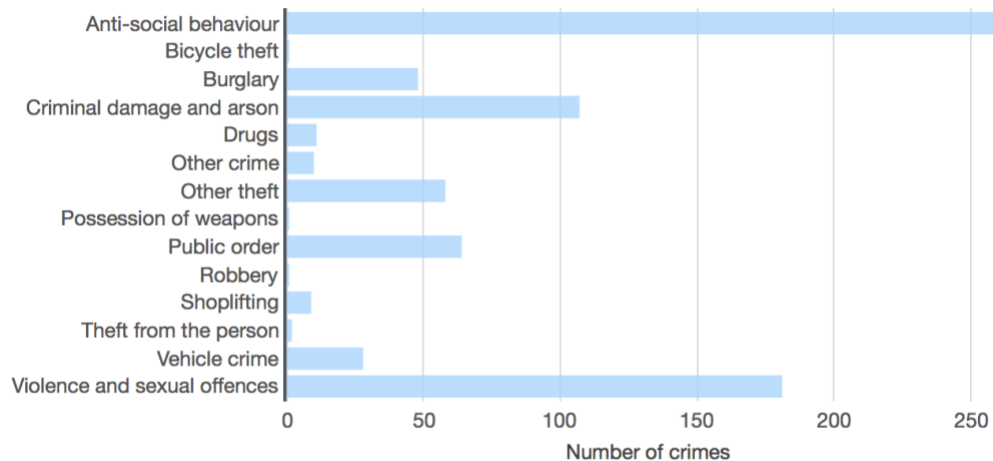
A number of small groups or individual protected trees are also located at the following locations. A further TPO covers the trees to the south and also the North West of the house, which originally screened the formal gardens of the house during the 19th and early 20th centuries. This area of woodland also extends to the gardens of the adjacent properties and the gardens of Park Cottage and The Vicarage also house groups of protected trees (BTCCA, 2017 – 2022, p 64)

1. On the boundary of the Broad Street Car Park and Waun Villa
2. The grounds of St Peter's Church
3. The grounds of Ty Mawr (BTCCA, 2017 – 2022, pp 61-63, 85)

Appendix 2

Anti-social behaviour rate in Blaenavon. [<https://www.police.uk/gwent/TP87/crime/stats/>]

Comparison of crime types in this area between February 2017 and January 2018

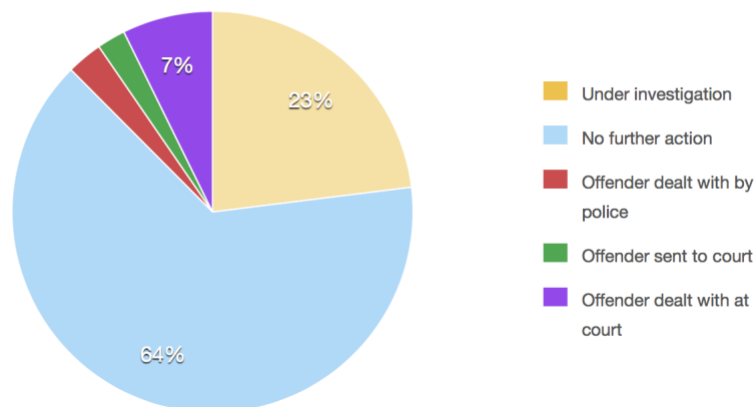


Crime type ↕	Total ↕	Percentage ↕
Anti-social behaviour	264	33.63%
Bicycle theft	1	0.13%
Burglary	48	6.11%

Appendix 3

Anti-social behaviour rate in Blaenavon. [<https://www.police.uk/gwent/TP87/crime/stats/>]

Comparison of outcomes in this area between February 2017 and January 2018



Appendix 4

Comparison of crime types in this area between February 2017 and January 2018 (Anti-social behaviour rate in Blaenavon. [<https://www.police.uk/gwent/TP87/crime/stats/>])

Crime type	Total	Percentage
Anti-social behaviour	264	33.63%
Bicycle theft	1	0.13%
Burglary	48	6.11%
Criminal damage and arson	107	13.63%
Drugs	11	1.40%
Other crime	10	1.27%

Crime type	Total	Percentage
Other theft	58	7.39%
Possession of weapons	1	0.13%
Public order	64	8.15%
Robbery	1	0.13%
Shoplifting	9	1.15%
Theft from the person	2	0.25%
Vehicle crime	28	3.57%
Violence and sexual offences	181	23.06%

Appendix 5

BTCCA, 2017 – 2022, pp 61-63, 85) Undesignated Assets (locally listed buildings):

1. Co-operative building, Church Road
2. Bethel Chapel, King Street
3. Park House
4. Vipond House
5. Old Wesleyan (Park Street) Methodist church

6. Old Wesleyan School
7. St Felix Roman Catholic church, Ellick Street
8. Market Tavern
9. Terraced cottages to the north of King Street
10. The Old Police Station
11. Castle Hotel
12. Lion Hotel
13. 32 Broad Street
14. Builder's Yard
15. Terraced Housing on High Street
16. Caddicks, North Street

Appendix 6

SWOT Analysis BTCCA, 2017 – 2022, p. 67).

The key issues affecting the management of the Conservation Area are:

Strengths:

1. the importance of the historic buildings & townscapes within a World Heritage Site;
2. best preserved example of a South Wales historic ironworking town;
3. set in a relict industrial landscape of acknowledged world importance;
4. unique form of the Valley settlement with key roads leading uphill;

5. the consistent integrated quality of the heritage environment;
6. the notable Listed buildings providing focal points of interest;
7. examples of high quality regeneration in Broad Street, and repairs/reuse of heritage buildings including St Peter's School as the WHS Visitor Centre;
8. Recent high-quality housing developments;
9. the setting, with the surrounding hills visible from most parts of the town;
10. the locational advantages for tourism - within the World Heritage Site and adjacent to the Brecon National Park;

Weaknesses:

1. decline in local economy has led to socio-economic deprivation, and an aging population reflected in weak demand for local goods, services & property;
2. low profitability of some businesses discouraging appropriate maintenance;
3. perceived lack of awareness amongst local residents concerning the heritage significance of their properties and a lack of appreciation or resources to carry out sensitive improvements to their properties;
4. poor quality of materials and detailing of many buildings;
1. lack of appropriate maintenance and care for heritage details;
2. inappropriate layouts, design and materials of some new development;
3. poor environments at 'gateways' to town and Conservation Area;
4. through traffic & most visitors take Church Road 'bypass' and miss town centre;

1. inappropriate signage and links between attractions, town centre and parking for visitor pedestrians and vehicles;
2. a small number of derelict buildings

Opportunities: (BTCCA, 2017 – 2022, p. 68).

1. improved heritage building maintenance and management;
2. sensitive regeneration of key sites, especially properties along Broad Street;
3. further development of high value tourism sector to increase town centre economic viability;
4. additional interpretation and marketing of town centre attractions;
5. improved interpretation and understanding of residential areas as well as commercial properties;
6. traffic and parking management to reduce adverse impact;
7. reuse of underused and vacant floor space;
8. increase in planning and design controls and guidance;
9. improve Conservation Area (CA) linkages with major tourism attractions.
10. potential educational opportunity to allow the residents of the Conservation area to research and understand the development of the area through historical research and archaeological investigations.
11. encourage the provision of niche retailing to cater for tourists and visitors to Blaenavon, to improve the vitality and viability of the town centre.

Threats:

1. continuing economic difficulties for shops and businesses
2. unused buildings lead to sense of neglect and decline;
3. lack of appropriate controls on historic building maintenance and alterations;
4. inappropriate designs of new infill buildings, extensions, shop fronts & alterations;
5. increasing traffic movement and parking impact;
6. and important visual link between town and Coity mountain could be damaged

Appendix 7

List of Businesses in the Gilchrist Thomas Industrial Estate

1. J Kennedy & Son Demolition Ltd - Civil Engineers, Gilchrist Thomas Industrial Estate, Pontypool, Gwent, NP4 9RL. T: 01495 792725
2. Phoenix Developments (homes) Ltd – Builders, Pontypool, Gwent, NP4 9RL
3. Shared Resource Services Business Solutions Limited - IT Consultants, Ty Cyd 3, Blaenavon Business Centre, Blaenavon, Pontypool, Gwent, NP4 9RL. T: 01495 742000
4. Penry Morgan(blaenavon)limited - Freight Services. Unit 18, Gilchrist Thomas Industrial Estate, Pontypool, Gwent, NP4 9RL. T: 01495 790482
5. Ellig Limited. Unit 4, Gilchrist Thomas Industrial Estate, Pontypool, Gwent, NP4 9RL. T: 01495 215909
6. J Kennedy & Son Demolition Ltd. Pontypool, Gwent, NP4 9RL
7. Sun Valley Poultry Limited. Pontypool, Gwent, NP4 9RL. T: 01432 352400
8. The Hog Roast Oven Company Limited. Pontypool, Gwent, NP4 9RL

9. Pool-I.D. UK Limited - Manufacturers Agents. Pontypool, Gwent, NP4 9RL
10. Rhymney Brewery Ltd – Brewers. Pontypool, Gwent, NP4 9RL. T: 01685 722253
11. G O S Tool & Engineering Services Ltd - Mechanical Engineering General. Unit 5 Heritage Court Road, Gilchrist Thomas Industrial Estate, Pontypool, Gwent, NP4 9RL. T: 01495 790230
12. H & H Engineering Blaenavon Ltd - Engineering Services. Unit 16a, Gilchrist Thomas Industrial Estate, Pontypool, Gwent, NP4 9RL. T: 01495 791330
13. J Kennedy Metals Ltd- Steel Stockholders. Pontypool, Gwent, NP4 9RL
14. G.O.S. Engineering Limited - Fabricated Metal Products. Pontypool, Gwent, NP4 9RL. T: 01495 790230
15. Eastern Valley Chemicals - Cleaning Materials and Equipment. Unit 12, Gilchrist Thomas Industrial Estate, Pontypool, Gwent, NP4 9RL. T: 01495 792929
16. Vin Sullivan - Catering Food and Drink Suppliers. Unit 2, Gilchrist Thomas Industrial Estate, Pontypool, Gwent, NP4 9RL. T: 01495 792792
17. Elite Arches - PVC Product Based Manufacturers and Suppliers. Unit 11, Heritage Court, Gilchrist Thomas Industrial Estate, Pontypool, Gwent, NP4 9RL. T: 01495 791900
18. B B I Solutions - Chemicals and Allied Products. Unit 15, Heritage Court, Gilchrist Thomas Industrial Estate, Pontypool, Gwent, NP4 9RL. T: 01495 790678
19. Super Rod - Tool Suppliers. Unit 12a, Gilchrist Thomas Industrial Estate, Pontypool, Gwent, NP4 9RL. T: 01495 792000
20. Lamella Structures - Chemical Manufacturers. Unit 7, Gilchrist Thomas Industrial Estate, Pontypool, Gwent, NP4 9RL. T: 01495 791831

21. Shared Resource Services Business Solutions Limited, Ty Cyd 3, Blaenavon Business Centre, Blaenavon, NP4 9RL

Appendix 8

Other benefits of Virtual Reality

1. Virtual Reality google to experience the Big Pit's working environment, Ironwork working environment and living lifestyle of the Ironworkers in the Stack Square and the Engine Row.
2. Updating the tourist attraction area inside the Stack Square and Engine Row Cottage for visitors and tourist to be able to view in the cottage and the ironwork as it used to be when they were operational and lived-in in the 1800s when they (visitors and tourist) wear the virtual Reality google, so that they can visualise/see exactly how it used to be.
3. The Virtual Reality can be use in the Pit Big for both when the underground elevator breaks down (which happened when I visited on 08/02/2018) and for people who do not want to go down the pit (due to fear, anxiety, asthma, physical disability especially people with using crutches and wheelchair may found it difficult to move about underground in the Big Pit tour during my visit on the 20/03/2018, when they could experience it on the ground using the Virtual Reality Google to visualise how work was carried out underground the Big Pit, the working conditions for the workers-children and adults, the living environment for the donkeys and horses used,

4. VR is useful when the Big Pit underground Tour is closed/cancelled due to the elevator shaft fault (usual occurrence) visitors can still experience Bit Pit in a different Tour guide, by been taken on tour guide around the Big Pit The tour can include explanation of what happen and how it came about from the Waiting rooms, Pit Head, Tram circuit/Lamproom, Saw Mill/Mortar Mill, Winding house, Mining Galleries, Fan House, Pit Head Baths Exhibition and Explosive Magazine room.

Appendix 9

These ideas were all welcome by the interviewee from Big Pit, Blaenavon Community Workmen-Hall, Blaenavon Shop owners and Blaenavon residents such as Mark Jones, John Scandrewtti, Mark Thomas, David Trapnell; June Matthews, Kahe Rowles, Heather Williams, Susan Fiander-Woodhouse and Ashley Parry agreed with this idea (Jones, 2018; Scandrewtti, 2018; Thomas, 2018; Trapnell, 2018; Matthews, 2018; Rowles, 2018; Williams, 2018; Fiander-Woodhouse, 2018; Parry, 2018, All were Personal communication, March 20, 2018).