Enterprise and Business Committee

Meeting Venue:
Committee Room 2 - Senedd

Meeting date:
8 October 2014

Meeting time:
9.20

Cynulliad Cenedlaethol Cymru
National Assembly for Wales

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Agenda

Pre-meeting in private (9.20)

Formal public meeting (9.35)

1 Introductions, apologies and substitutions

2 Economic Priority Sectors - Scrutiny of Sector Panel Chairs - Panel 1

(9.35-10.20) (Pages 1 - 20)

Ron Jones, Chair, Creative Sector Panel
Chris Nott, Chair, Financial and Professional Services Sector Panel
David Jones, Deputy Chair, ICT Sector Panel

Attached Documents:
Research Brief
EBC(4)-24-14 (p. 1) – Minister for Economy, Science and Transport

Break (10.20-10.30)

3 Economic Priority Sectors - Scrutiny of Sector Panel Chairs - Panel 2 (10.30-11.15)

David Joyce, Chair, Construction Sector Panel
Roger Evans, Deputy Chair of Advanced Materials and Manufacturing Sector Panel

4 Economic Priority Sectors - Scrutiny of Sector Panel Chairs - Panel 3 (11.15-12.00)

David Williams, Chair, Energy and Environment Sector Panel
Dr Grahame Guilford, Deputy Chair, Life Sciences Sector Panel

5 Papers to note (Pages 21 - 82)

Attached Documents:
EBC(4)-24-14 (p. 2) – Edwina Hart to William Graham on Electrification - 30 Sept 14
EBC(4)-24-14 (p. 3) – Edwina Hart to William Graham on Regional Spending on Roads - 30 Sept 14
EBC(4)-24-14 (p. 4) – Edwina Hart to William Graham – Annex with Breakdown of Spending on Roads by Region – 30 Sept 14
EBC(4)-24-14 (p. 5) – Huw Lewis to William Graham on Further Maths - 1 Oct 14
EBC(4)-24-14 (p. 6) – Evaluation of Further Maths Support Programme
EBC(4)-24-14 (p. 7) – Note of Llechwedd Meeting – Table 1
EBC(4)-24-14 (p. 8) – Note of Llechwedd Meeting – Table 2
EBC(4)-24-14 (p. 9) – Note of Llechwedd Meeting – Table 3 v 2
EBC(4)-24-14 (p. 10) Edwina Hart to William Graham on North-South Journey Time

De-Brief (12.00-12.15)

Agenda Item 2

Document is Restricted

Introduction

The purpose of this paper is to set out written evidence on Welsh Government Economic Priority Sectors for the Enterprise and Business Committee.

As part of its approach to economic development, the Department for Economy, Science and Transport support is focussed on Economic Priority Sectors which are key to the economy of Wales. This approach complements wider interventions both within the Department and across the Welsh Government to encourage jobs and growth.

The Role and Remit of the Sector Panels

Six Sector Panels were established under the Economic Renewal Programme of Welsh Government in 2011, namely, Advanced Materials & Manufacturing, Financial & Professional Services, Creative, Energy & Environment, ICT and Life Sciences. In 2012, Tourism and Construction Sectors were added. The Sector Panel's role is to provide advice to Welsh Ministers and to lead the Sector teams focusing on job creation and driving economic growth.

Sector Panels develop specific strategies for individual sectors taking account of the opportunities and threats emerging from the economic cycle.

Sector Panels are able to advise on a wide range of government issues from sector specific enterprise zones to business collaboration hubs, city regions and business rates.

Strategies, Action Plans and Delivery for the Sectors

Strategic priorities for the Sectors are outlined in the Sectors Delivery Plan published on the Welsh Government website. The Plan outlines the opportunities and challenges, as well as the short, medium and long-term strategic priorities. The Sectors provide regular updates on performance against strategic priorities, which are published on the Welsh Government website.

The Plan and Sector performance updates can be accessed through the following link: http://wales.gov.uk/topics/businessandeconomy/sector/?lang=en

On 18 September, we published an annual report on priority sector statistics, which includes data on Gross Value Added, employee jobs, hourly earnings by gender, employment by qualification level and some local authority estimates. The report can be accessed through the following link:

http://wales.gov.uk/statistics-and-research/priority-sector-statistics/?lang=en

In 2013/14 Sectors and Business supported 37,058 jobs across Wales which represented a 65% increase on the previous year when compared on a like for like basis. The forward pipeline of future job creation projects is strong and suggests this level of real achievement is sustainable.

Resource Allocation to Support Sectors

The Sector and Business published budget for 2014/15 is £51m Revenue and £83.1m Capital. In addition to funding sector specific job creation projects, this

budget also funds support functions which apply across all sectors including Science and Innovation, Legacy SIF, R&D, A4B, Entrepreneurship, Trade, Property, Access to Finance (including Finance Wales) and digital support.

Funding is allocated to individual job creation projects using a risk assessment underpinned by value for money principles.

A key part of each project appraisal involves "fit with sector panel strategy" and takes account of indirect job benefits for the economy including support for the Wales supply chain.

Progress / Opportunities and Threats

Advanced Materials and Manufacturing (AM&M)

Since inception, the panel has challenged the repayable aspect of finance in both capital and innovation projects and challenged the sector budget levels. The panel, has lobbied for a suite of Skills interventions with adequate funding. Furthermore, a direct recommendation was made to amalgamate the key Government supported-forums in AM&M (Aerospace, Automotive and Electronics and Software trade bodies) as a single AM&M industry-representative entity.

Enterprise Zones

Over 3,200 jobs have been supported in the AM&M aligned Enterprise Zones. With growth in key sub sectors such as Automotive, Aerospace, Rail and Space, the AM&M aligned Enterprise Zones offer Wales the opportunity to capture some of this growth through expansion of existing companies and targeted inward investment opportunities. The sector sees as a priority, the promotion of the Enterprise Zones as a key part of the AM&M UK and overseas trade programme collateral. This includes prioritising the Enterprise Zones as suitable locations for AM&M capacity building projects and in discussions with potential inward investors.

Opportunities and Threats

There are significant opportunities that exist in exploiting the strengths in Wales' automotive and aerospace sectors and developing and growing capability in Rail and other AM&M high grow segments. The key sub sectors in AM&M have proved to be particularly resilient to a global recession and are well positioned to benefit from forecasted future growth.

The key threats to the sustainability of the AM&M sector include the cost of energy, availability of materials, cuts in UK Government spending e.g. defence and globalisation (with increased completion not only through costs but scale and technology from many global economies) resulting in off-shoring and lost FDI. Further threats are present in the form of emergent, disruptive technologies such as composites and Additive Layer Manufacturing and the risk of Welsh business underinvestment to respond to these challenges.

Construction

In its second term, the panel focused specifically on delivery. It also provided advice on a number of regulatory and legislative changes which were, and are, likely to

affect the sector, concentrating on the manner in which the interests of business and economic growth would be best served.

The panel was instrumental in the establishment of the pilot Construction Sector Development Fund, aimed at assisting SMEs in the sector, and the Construction Futures Wales programme, in partnership with the Construction Industry Training Board (CITB) in Wales.

In pursuing its focus on delivery, and with a view to seeking a wider view from the industry, during the early part of 2014, the panel arranged a number of events at which selected key representatives of the Construction and associated sectors were able to engage with the Panel. The panel found this process invaluable in helping to shape its forward strategy on how to support the sector.

Opportunities and Threats

The pipeline of projects available to Welsh companies, including those highlighted in the Wales Infrastructure Investment Plan, is considerable. For example, the new prison at Wrexham; the new build of a power station and associated infrastructure at Wylfa; the development of the rail network both within Wales and beyond; and major expenditure on the motorway and trunk road network. The panel is active in seeking to bring forward support which will enable the Welsh supply chain to be equipped to deliver to these projects. There is also a need to perpetuate the commitment to promoting BIM (Building Information Modelling).

Whilst the introduction of several major infrastructure projects is a clear opportunity for the sector in Wales, it can also be considered a potential threat. This is in terms of ensuring that the workforce has the required skills, and that Welsh companies have the ability and capacity to access the relevant supply chains to ensure the economic benefits are maximised. The sector's Construction Futures Wales programme will be a key business support intervention to assist the sector in this regard.

The Enterprise Zone on Anglesey is a significant opportunity for the sector in terms of the construction of energy projects, including the significant investment opportunity the nuclear new build represents. The sector has already provided financial assistant to a local company on Anglesey. DU Construction is expanding, building a new operational centre and investing in new plant to be in a position to maximise opportunities from the Wylfa Newydd development and other projects on the island. The £470,000 investment, which was supported by £210,000 from the Economic Growth Fund, will create twenty new jobs within the Zone.

Creative Industries

Since the Panel's inception, the Creative Industries Sector Team has helped create or safeguard over 2,900 jobs and to attract more than £105m investment into Wales.

The team has supported Welsh creative businesses in a variety of subsectors, including drama series *Hinterland*, and two series of prime-time BBC fantasy drama *Atlantis*. Besides home-grown successes, we are also attracting international investment into Wales, targeting high-end TV drama, TV and film co-production, and digital media. International projects successfully secured include three series of

high-end TV drama *Da Vinci's Demons* and investments in digital media jobs by OysterWorld Games, Sorenson Media and Newsquest.

58 projects have been supported through the Digital Development Fund, launched in 2011 to support the development and exploitation of new digital products and services. Wales Screen, our film and TV locations service, has assisted over 950 production enquiries since 2010, including *Snow White and the Huntsman, Pride*, *Doctor Who*, *Casualty* and *Stella*. Our MEDIA Antenna Wales service helped Welsh companies to secure over €2.5m in grants from the EU's MEDIA programme (2007-2013). The sector team now operates Wales' Creative Europe Desk, which replaces MEDIA Antenna Wales under this new programme.

In February this year, the Welsh Government announced an exclusive deal with Pinewood Shepperton to create a world-class new studio, Pinewood Studio Wales which will form part of Pinewood's global network of film studios. Alongside this a £30m commercial Media Investment Budget is being made available for qualifying film and high-end television production.

Opportunities and Threats

The west-coast of the USA remains a primary target market for both trade and investment. Our activity in the US and elsewhere is now being supported by our collaboration with Pinewood, who are promoting Wales and the Welsh creative industries offer through their overseas offices.

With the expansion in the sector, we are now focused on improving the pipeline of skilled people entering the industry. In the Creative Industries, the costs of entering markets are uniquely low and new businesses and business models are born daily. But good ideas can be overtaken by better ones and markets quickly won can be lost just as quickly. New skills are needed all the time and sometimes more quickly than our education system and training provision can match.

The risk profile of government support may be higher than we are used to. The absence of sufficient venture capital in Wales places more of the responsibility for early-stage funding on the government than in other industries. The Welsh Government has adopted new and appropriate strategies to make sure that there is a proper balance between the needs of the sector and the need to ensure proper accountability for public money.

Energy and Environment

Since the Panel's inception in 2011, the economic and political climate has changed significantly; in particular perceived risk has increased. However the panel have reaffirmed that Money, Grid and Consent are the primary enablers for investment. As such the focus of the panel and Energy & Environment team has been on creating the right business environment in which projects can flourish.

Progress has been made and Wales is 'home to a thriving, well balanced and growing Energy & Environment sector' (Innovas Report [1]). RWE Innogy's flagship Gwynt y Mor offshore wind farm, one of the largest in Europe, has led to further

[1] Energy & Environment Mapping Study - Executive Summary

development at Port of Mostyn and more than £70m of contracts being awarded to Welsh companies.

Enterprise Zones

The Nuclear sector will present significant opportunities for Welsh businesses across the whole economy which will not just be limited to activity in Wales or new build. Wales has significant nuclear experience and this will place Welsh businesses in a position to compete in UK, EU and global markets. In addition the Trawsfynydd Options Assessment has helped to define a clearer strategic direction and further work is now being undertaken on de-risking the site for low carbon energy use.

With two marine demonstration zones off the Welsh coast being recently announced, we continue to work with key stakeholders to maximise the economic benefits from investment in the marine sector, e.g. Deltastream.

Opportunities and Threats

The market for renewable energy in Wales has notably increased over the last three years, particularly in comparison with England. With the sector acting as an enabler, particularly for Construction and Advanced Materials & Manufacturing, as large scale projects are brought forward further opportunities will be created, in particular the construction of low carbon buildings for both the domestic and commercial market.

The cost of energy remains a concern particularly for energy intensive industries, and the Energy & Environment team is working with the sector to providing tailored flexible packages of support.

Financial and Professional Services

Since inception, offers of funding from the sector has secured contractual commitment to the creation of over 1,600 new jobs and safeguarding of a further 800 jobs. Furthermore, the Welsh Government has been assisting businesses in the Sector who have created more than 5,800 further Wales-based jobs.

The Panel has been: scoping and delivering a number of training, educational and apprenticeship programmes; helping to develop a digital internet exchange (IXP) in Cardiff leading to Wales and the Cardiff Capital Region being labelled as one of the UK's growing Fintech (financial technology) hubs by UKTI and the Financial Services Organisation; honing the Sector proposition to position Wales as the best hub for F&PS businesses outside of London. TheCityUK and the Chartered Institute of Securities and Investments (CISI) have both firmly designated Cardiff as one of the UK's core regional financial centres outside of London.

The panel have been working with the Whitehall Industry Group (WIG) on the promotion of Wales to the UK Government as the location for both Direct and Outsourced service delivery to the public sector. WIG is planning two Wales-focussed events to help with this, one in London in autumn 2014 and another in Wales in January 2015.

They have been assisting the legal sector in Wales as it faces unprecedented challenges arising from the Legal Services Act 2007 and the reduction in the Legal Aid budget. Working with The Law Society Wales, the Welsh Government is

supporting research into the changing legal landscape and assisting legal firms with a series of seminars across Wales.

The panel has also had ongoing substantial involvement in the creation of Finance Wales' new funds, including the £20m Wales Capital Growth Fund and the £7.5m Wales Technology Seed Fund, both launched in April 2014.

Enterprise Zones

The Sector has been supporting the development of the Central Cardiff Enterprise Zone, which has seen major developments including construction of Grade A office space, the opening of Pellet Street footbridge to link the Capital Quarter office development site with the city centre and the announcement that most of the Zone is to benefit from EU Assisted Area status.

Opportunities and Threats

Wales, led by the Cardiff Capital Region with the Enterprise Zone at its heart, presents a compelling opportunity for businesses to locate and thrive. As knowledge of our offer grows more and more businesses will see Wales as a natural location for consideration for their location strategies. This will also be aided by the improving economic conditions as we emerge from the recession. The new Sector Panel, which will be announced shortly, will add further impetus to our visibility.

Competition for jobs in the UK is fierce and many other regions work hard at communicating their advantages and enhancing their offer. Welsh Government is focussed on continuing to enhance the offer on the ground in Wales, building on the successful work already undertaken in creating new assisted areas in Wales and catalysing commercial property development in the Capital.

ICT

The ICT sector in Wales spans electronics, software and services, with a healthy mix of large multi-nationals and home grown SMEs. This is supported by an active research community in its universities and strong academic / business links such as the Institute of Life Science in Swansea.

The sector strategy sets out 'priority areas' such as: Exploitation of Welsh ICT assets; Greater collaboration between ICT suppliers & users; Driving an increase in R&D and innovation; with 'underpinning themes': Education & skills; International; and Support for SMEs and start-ups. Significant progress has been made in a number of areas.

The Welsh ICT sector has received good support from the Sector Team guided by its Sector Panel. This has helped to create, safeguard and / or assist more than 3,600 high end jobs and attract more than over £26m investment to Wales since inception. Businesses supported by the sector team include General Dynamics, IQE, Airbus Space & Defence, Sony, Alert Logic, CGI and Trusted Data Solutions.

The ICT Sector Panel and Team jointly shaped and delivered the highly acclaimed Digital 2014 event. This well attended event created new business opportunities, engaged young people and served as a showcase for the industry in Wales. On the back of this success in June 2014 the team launched 'Digital Tuesdays', a monthly

networking event for the industry which has already built an active community of more than 300 people.

The ICT Sector Panel and Team have influenced wider Welsh Government policy through engagement with the Department for Education & Skills and the subsequent launch of an innovative, joint 'Digital Pathways' programme to raise skill levels in the sector.

Opportunities and Threats

The Sector is focussed on the following areas as both opportunities and threats to the development of the ICT sector in Wales:

- keeping pace with the rapid development in digital technologies and the significant associated market opportunities;
- the decline in the number of companies and people employed in the ICT sector since 2002;
- the need to raise and improve the international profile of the Welsh ICT sector; and
- the need to address the increasing shortage of qualified, time-served ICT professionals across all sectors in Wales.

Life Sciences

The Life Sciences Sector Panel strategy, based on the following four interlocking elements, is facilitating the growth of a dynamic life science ecosystem in Wales:

- The establishment of a Life Science Investment Fund;
- The establishment of Life Sciences Hub to provide a physical focus for Life Sciences in Wales;
- Stepping up international activity and raising our profile; and
- Developing a vibrant Life Sciences ecosystem with international reach

Since its establishment in 2013, the Wales Life Sciences Investment Fund has made five investments to date. These investments have attracted considerable levels of co-investment into Wales and have also significantly raised the global profile of the sector in Wales as a thriving location for Life Sciences companies.

Since its opening in July 2014, the Life Sciences Hub Wales, a national and international focal point for the Life Sciences and Healthcare sectors in Wales, is already presenting significant opportunities to the sector.

As well as global companies such as GE Healthcare and Siemens, which are already based in Wales, multinationals, such as Eli Lilly and Johnson & Johnson Innovation, have recognised the benefit in engaging with Life Sciences in Wales and have signed up to the Hub in order to be part of the growth plans for the sector.

In addition, the opening of the Welsh Wound Innovation Centre in September 2014, on the back of Panel advice and support, further cements Wales' growing reputation in the field of regenerative medicine. The existence of this facility has already secured two international inward investments in recent months.

BioWales, the signature event for the sector in Wales continues to grow, attracting 350 attendees in 2011, 500 attendees in 2012 and 550 in 2013. BioWales 2014 further excelled on all targets, attracting 650 delegates and hosting over 1000 partnering meetings.

Opportunities and Threats

Opportunities for the Sector include:

- Life Sciences Hub Wales
- Welsh Wound Innovation Centre
- Wales Life Sciences Investment Fund creating deal flow of new business

Threats for the Sector include:

- Availability of specialist skills
- Availability of specialist property
- Slow/low adoption and diffusion of new technologies and innovation

Tourism

Tourism makes a vital contribution to the economic and social wellbeing of Wales. In 2013 the sector directly employed 121,400 which is 9.4% of the workforce.

In 2013 we saw growth in trips and spend from staying visitors from both GB and International markets to Wales. Early results for the first half of 2014 show continued growth. Provisional results form the Great Britain Tourism Survey for the first five months of 2014 show that total trips to Wales (3.47 million) were 14.6% up in comparison with the first five months of 2013, while the GB total was 2.9% down. Associated expenditure in Wales (£564m) was up by 9.9% while spend in Britain as a whole was 2.9% down.

The GB Day Visits Survey results for the first six months of 2014 show that some 48 million day visits were made to destinations in Wales, some 19% up on the corresponding period in 2013 (40 million trips). Associated expenditure was 3% up. These figures also compare favourably with those for GB as a whole, for which trips were down by 1% and expenditure down 5%.

In 2013-14, 256 jobs were created, 101 jobs were safeguarded, 5,543 indirect jobs were supported and £251m investment was generated from across all elements of tourism activities, including capital projects, cruise development and major events. Additional spend generated by visitors who were directly influenced to come to Wales due to all elements of our marketing activity was £180m for 2013.
On St David's Day 2014, the new £4m "Have you Packed for Wales?" multi-media campaign was launched, targeting the UK and Republic of Ireland. The campaign aims to encourage Wales's target markets to revaluate their perception of Wales by showcasing specific product and destination experiences.

Visit Wales's autumn UK & Ireland marketing activity started during September 2014, and showcases Wales's food offering in the context of quality autumn breaks. The campaign will include direct marketing contact with over 800,000 previous campaign respondents. Planning for spring 2015 campaign activity in the UK, Ireland and Germany is currently in progress. 2015.

Edwina Hart MBE CStJ AC / AM
Gweinidog yr Economi, Gwyddoniaeth a Thrafnidiaeth
Minister for Economy, Science and Transport

Llywodraeth Cymru
Welsh Government

Ein cyf/Our ref

William Graham AM
Chair
Enterprise and Business Committee
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30 September 2014

Dear William

I am writing in advance of my appearance at Committee this week to provide a brief note setting out the Welsh Government's responsibilities in terms of rail in Wales.

The National Assembly for Wales does not have legislative competence in respect of the provision and regulation of rail services, and the Welsh Ministers have only a limited role in making decisions about rail franchises that serve Wales. The Secretary of State for Transport is the rail franchising authority in England and Wales, as provided by the Railways Acts 1993 and 2005. The legislation makes specific provision about the Welsh Ministers' role in the rail franchising process.

Before issuing an invitation to tender and entering into a franchise agreement where the services to be provided under the agreement are or include Welsh services, the Secretary of State must consult the Welsh Ministers.

The Secretary of State may not enter into a franchise agreement relating to services that are or include Wales-only services (that is services that start and

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finish in Wales making no stops in England) unless the Welsh Ministers joins with him as a party to the agreement.

The Welsh Ministers do have limited power to provide, or to agree to provide, financial assistance to the franchisee for the purpose of improvement or development of any Welsh services to which the franchise agreement relates. It is on this basis that a number of the improvements to rail services in Wales have been funded by the Welsh Government.

As the Committee is aware from its inquiry into the future of the Wales and Borders franchise, the current agreement ends in October 2018. It is possible for the franchise to be extended for up to a further five years until 14 October 2023. The decision on whether an extension should be considered is a matter for the Secretary of State for Transport.

I share the views expressed by the Committee in its Charter for the next Wales and Borders franchise, which was published in December last year and I am continuing to press the UK Government for the necessary powers and requisite funding to be devolved so that the Welsh Government is responsible for specifying and procuring the next Wales and Borders franchise.

As with rail franchising, the role of the Welsh Ministers in setting the priorities and funding of the rail infrastructure in Wales is limited. The responsibility for presenting the High Level Output Specification that sets the priorities for Network Rail remains with the Secretary of State for Transport. Welsh Ministers are consultees in this priority setting process for our railway infrastructure, which limits our ability to deliver infrastructure improvements. This has been highlighted in the ongoing discussions with the Secretaries of State of Wales and Transport in relation to electrification of the Valleys Lines.

I have written to the Secretary of State for Wales about south Wales rail electrification and I am continuing to work with the UK Government to provide more detail on the costs and options required to deliver the electrification of the Valleys Lines, to which we remain fully committed.

Edwina Hart MBE CStJ AC / AM
Gweinidog yr Economi, Gwyddoniaeth a Thrafnidiaeth
Minister for Economy, Science and Transport

Llywodraeth Cymru
Welsh Government

Eich cyf/Your ref
Ein cyf/Our ref

William Graham AM
Chair – Enterprise and Business Committee
National Assembly for Wales
Cardiff

30 September 2014

Dear William

I am writing to update the Committee on the Welsh Government's expenditure on roads across Wales. The headline figures for expenditure by region are set out in the table below:

Expenditure on road schemes in Wales, by region and date of spend

	2011 to date	Future	Total
Expenditure - £ millions			
North Wales	93.592	398.289	491.882
Mid Wales	43.034	79.247	122.281
South West Wales	102.736	60.950	163.687
South East Wales	176.643	1,217.775	1,394.418
All Wales - Total	416.006	1,756.262	2,172.267
Expenditure per head (2013 population) - £s			
North Wales	135	576	711
Mid Wales	206	380	586
South West Wales	149	89	238
South East Wales	118	815	934
All Wales - Average	135	570	705

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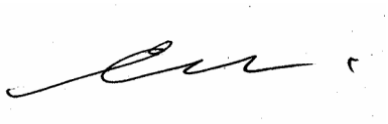
The attachment to this letter provides further detail about individual projects and programmes.

The information has been drawn together from our finance system and project records. It represents the most accurate picture possible, given the information available, the sometimes complex interactions with other sources of funding and the challenges of separating out roads spend in some grant programmes. I should also note that the forward look is based on current plans and assumptions and will be subject to change. For example, I have yet to make decisions on grants to local authorities in future years so these lines generally show zero future expenditure, but in fact funding will be made available.

I hope that this information is helpful.



NORTH WALES

Expenditure £'s

Local Authority	Scheme Type	Scheme Name	2011 to date	Future	Total
Anglesey	Local	Llangefni Link Road	365,000	0	365,000
	Trunk	Britannia Bridge	300,000	0	300,000
Anglesey /	Local	Surface Access – Anglesey Airport	158,000	0	158,000
Gwynedd	Trunk	A55 Britannia Bridge	40,000	0	40,000
Conwy	Trunk	-A470 Pont yr Afanc, A5 Sth of Cerrigydrudion, A55 rainbow bridge, A5 W Hendre Arddwyfaen, E27A55 Tunnels safety improvement	18,845,000	32,500,000	51,345,000
	Trunk	A55 Junctions 15 and 16 Improvements	10,000	31,600,000	31,610,000
Denbighshire	Trunk	-A55 Talardy Para Refurb,A494 maesgarnedd Jctn, A5 Llangollen Golf Club, A494 Ruthin Vale	216,000	0	216,000
	Trunk	A5 Pont Melin Rug	165,000	0	165,000
	Local	Foryd Rd Junction Improvements	160,000	0	160,000
Flintshire	Trunk	A494/A550 Deeside Park to Drome Corner	90,000	206,270,000	206,360,000
	Trunk	-A55 J29 to 21, A55 Refuge/Crossovers	4,300,000	0	4,300,000
	Local	Shotton Corridor Signalisation B5129	450,000	0	450,000
	Trunk	A494 Drome Corner to Ewloe	44,000	0	44,000
Gwynedd	Trunk	A487 Caernarfon to Bontnewydd	921,000	103,927,000	104,847,000
	Trunk	A487 Dyfi Bridge	65,000	22,880,000	22,945,000
	Trunk	A487 Porthmadog, Minffordd and Tremadog	15,694,000	446,000	16,140,000
	Trunk	A470 Maes yr Helmau – Cross Foxes	10,123,000	472,000	10,595,000
	Trunk	A470 Gelligemlyn	9,185,000	176,000	9,361,000
	Local	- Pont Briwet, A493 Pontbren to Nant y Gwenlli, Pont Dr Williams School, Dolgellau	3,757,000	0	3,757,000
	Trunk	Dolgellau, A487 Golan Junction, A55 Aber Tai'r Meibion	3,015,000	0	3,015,000
	Local	-A497 Abererch to Llanystumdwy, A499 Aberdeasch to Llanhaelaearn	1,311,000	0	1,311,000
	Local	-A493 Pontbren to Nant y Gwenlli, A496 Maentwrog Junction to Blaenau Ffestiniog, A496 Snowdonia Enterprise Zone Llanbedr	1,298,000	0	1,298,000
	Trunk	A470 Penloyn - Tan Lan, Llanrwst	727,000	1,000	728,000
	Trunk	Cancoed	629,000	0	629,000
	Trunk	A470 Llanrwst – Hafod	221,000	0	221,000
	Trunk	A487 Llanwnda-Llanllyfni (ID)	145,000	18,000	163,000
	Trunk	A470 Plas Maenan and Bodhyfryd	125,000	0	125,000
	Trunk	A470 Lledr Valley Stage 2	16,000	0	16,000
Wrexham	Local	Wrexham Industrial Estate Access Road	20,905,000	0	20,905,000
	Local	-West Wrexham Highway Capacity Improvements, Improved Access to Wrexham Maelor Hospital	312,000	0	312,000
Total			**93,592,000**	**398,289,000**	**491,882,000**
of which					
	Local		28,716,000	0	28,716,000
	Trunk		64,877,000	398,289,000	463,166,000

Notes

Local: Regional Transport Consortia Grant, Transport Grant, Local Transport Fund

Trunk: Infrastructure Delivery, Network Management

Rounding Data have been rounded to the nearest £1,000, so totals may differ from the sum of components

MID WALES

Expenditure £'s

Local Authority	Scheme Type	Scheme Name	2011 to date	Future	Total
Ceredigion	Trunk	A487 Glandyfi	18,337,000	0	18,337,000
	Trunk	-A487 Tesco Junction Cardigan,A487 Dorglwyd Roundabout, A487 Dolgau Farm, A44 Gelli Farm, A487 Aberarth Phase 2, A487 Morfa Fram Tanrallt	1,344,000	0	1,344,000
	Local	Ceredigion Link Road	650,000	0	650,000
	Local	A486 Post Bach to Synod Inn	538,000	0	538,000
Powys	Trunk	A483 Newtown	4,612,000	78,420,000	83,032,000
	Trunk	A470 Cwmbach to Newbridge	14,302,000	222,000	14,525,000
	Trunk	A486 Four Crosses	2,249,000	5,000	2,254,000
	Trunk	-A44 W Glansevern Arms, A458 Cefn Bridge, A487 Talyllyn Pass, A483 Newtown, Dyfi Bridge	307,000	600,000	907,000
	Local	Brecon Improvements + others	345,000	0	345,000
	Trunk	A470 Alltmawr	319,000	0	319,000
	Trunk	A470 Builth Wells	15,000	0	15,000
	Trunk	A479 Talgarth Relief Road	14,000	0	14,000
Total			**43,034,000**	**79,247,000**	**122,281,000**
of which					
	Local		1,533,000	0	1,533,000
	Trunk		41,501,000	79,247,000	120,748,000

Notes

Local: Regional Transport Consortia Grant, Transport Grant, Local Transport Fund

Trunk: Infrastructure Delivery, Network Management

Rounding Data have been rounded to the nearest £1,000, so totals may differ from the sum of components

SOUTH WEST WALES

Expenditure £'s

Local Authority	Scheme Type	Scheme Name	2011 to date	Future	Total
Carmarthenshire	Trunk	Abraham	4,313,000	0	4,313,000
	Local	-Cross Hands Economic Link Rd Phase 2, Carm West Link Rd, Wind St,Tir y Dail Lane Junction, Ammanford Distributor Rd Phase 2	1,065,000	0	1,065,000
	Trunk	A483 Llandeilo	322,000	0	322,000
	Local	-A485 North Carms & Ceredigion Link, Ammanford Distributor Road	26,000	0	26,000
Pembrokeshire	Trunk	A477 St Clears/Llanddowrorto Red Roses	60,018,000	3,100,000	63,118,000
	Trunk	A40 Llanddewi Velfrey-Penblewin	0	57,185,000	57,185,000
	Trunk	A40 Penblewin to Slebech	4,276,000	265,000	4,541,000
	Local	Glasfryn Rd Improvement St Davids	1,083,000	0	1,083,000
	Local	Northern Distributor Network – Bulford Road	775,000	0	775,000
	Trunk	A477 Finger Post Junction	758,000	0	758,000
	Trunk	A477 Nash Fingerpost-Bangeston	336,000	0	336,000
	Trunk	A40 The Kell	174,000	0	174,000
	Trunk	A477 Sageston Redberth Bypass	36,000	0	36,000
Neath Port Talbot	Local	Port Talbot Peripheral Distributor Road – 3 stages	23,116,000	0	23,116,000
	Trunk	M4 J38-41, M4 J41	1,119,000	400,000	1,519,000
	Local	Baglan Energy Park Link Bridge	1,500,000	0	1,500,000
	Local	Access to Kenfig Industrial Estate	989,000	0	989,000
Swansea	Local	Morfa Distributor Road	1,500,000	0	1,500,000
	Local	Morfa Rd	1,330,000	0	1,330,000
Total			**102,736,000**	**60,950,000**	**163,687,000**
of which					
	Local		31,384,000	0	31,384,000
	Trunk		71,353,000	60,950,000	132,303,000

Notes

Local: Regional Transport Consortia Grant, Transport Grant, Local Transport Fund

Trunk: Infrastructure Delivery, Network Management

Rounding Data have been rounded to the nearest £1,000, so totals may differ from the sum of components

SOUTH EAST WALES

Expenditure £'s

Local Authority	Type	Scheme Name	2011 to date	Future	Total
M4 - related					
Newport and Cardiff	Trunk	M4 Magor-Castleton Corridor Enhancement	10,779,000	800,000,000	810,779,000
Newport	Trunk	M4 Brynglas Tunnels Refurbishment	0	40,006,000	40,006,000
Newport	Trunk	M4 Junction 28 Improvement	140,000	28,795,000	28,935,000
Newport and Cardiff	Trunk	M4/A4810 Magor-Castleton CEM Steelworks Access Road	24,091,000	865,000	24,956,000
Cardiff	Trunk	-M4 to A470 Dedicated Lane, M4 J33, M4 J32	10,158,000	500,000	10,658,000
Newport	Trunk	M4 Tunnels Concrete Barrier	1,641,000	0	1,641,000
Cardiff and Newport	Trunk	M4 Widening Castleton to Coryton	981,000	615,000	1,596,000
A465 - related					
Blaenau Gwent and Monmouthshire	Trunk	A465 Gilwern to Brynmawr Section 2	15,973,000	192,889,000	208,862,000
Blaenau Gwent	Trunk	A465 Brynmawr to Tredegar Section 3	92,289,000	63,170,000	155,459,000
Merthyr Tydfil and RCT	Trunk	A465 Dowlais Top to A470 Section 5	41,000	18,265,000	18,306,000
Monmouthshire	Trunk	A465 Abergavenny to Gilwern Section 1	795,000	0	795,000
Merthyr Tydfil	Trunk	A465 : A470 to Hirwaun Sections 6 & 7	215,000	0	215,000
Caerphilly and Merthyr Tydfil	Trunk	A465 Tredegar to Dowlais Top Section 4	147,000	0	147,000
Other trunk road					
Cardiff	Trunk	A4232 Cardiff Eastern Bay Link	189,000	47,889,000	48,079,000
Vale of Glamorgan	Trunk	Cardiff Airport Access	218,000	24,781,000	24,999,000
Local road schemes					
Caerphilly	Local	-A4048 Sirhowy Enterprise Way, Greater Bargoed Community Regeneration Scheme, Ysbyty Ystrad Fawr	9,404,000	0	9,404,000
RCT	Local	-Porth/Lower Rhondda Fach Relief Road, Church Village Bypass	6,732,000	0	6,732,000
Blaenau Gwent	Local	-Mountain Rd Ebbw Vale, Libanus Rd Ebbw Vale	1,602,000	0	1,602,000
Torfaen	Local	Pontypool A4043, A4043/A472 Junction	833,000	0	833,000
Newport	Local	George S/Lower Dock St Junction Improvements	400,000	0	400,000
Vale of Glamorgan	Local	Five Mile Lane	14,000	0	14,000
Total			**176,643,000**	**1,217,775,000**	**1,394,418,000**
of which					
	Local		18,985,000	0	18,985,000
	Trunk		157,658,000	1,217,775,000	1,375,433,000

Notes

Local: Regional Transport Consortia Grant, Transport Grant, Local Transport Fund

Trunk: Infrastructure Delivery, Network Management

Rounding Data have been rounded to the nearest £1,000, so totals may differ from the sum of components

Huw Lewis AC / AM
Y Gweinidog Addysg a Sgiliau
Minister for Education and Skills

Llywodraeth Cymru
Welsh Government

William Graham AM,
Chair of the Enterprise and
Business Committee,
The National Assembly for Wales

1 October 2014

Dear William,

In my letter of 1 July, I agreed to provide a copy of the final evaluation report on the Further Mathematics Support Programme (FMSP). I am pleased to attach a copy of this report which was published on the Welsh Government's website last week. The report can also be accessed on the Welsh Government website:http://wales.gov.uk/statistics-and-research/evaluation-further-mathematics-support-programme-pilot/?lang=en.

The findings of this evaluation report are really encouraging, showing year-on-year increases in the number of learners in the pilot area studying further mathematics at both AS and A level. There has also been a steady increase in the numbers from the pilot area enrolling on mathematics and mathematics-related course at university. Some key findings from the report are bulleted below.

Data from the Lifelong Learning Wales Record and Welsh Examinations Database on examination entries showed a sharp rise in A2 level entries since the beginning of the pilot, e.g. a four-fold increase between 2010 and 2011.

Between 2010 and 2013, passes at the highest levels (A*A) in the pilot area increased more than four-fold and in the rest of Wales by more than half.

More schools and colleges in Wales offering further mathematics, either individually, or in collaboration. In the pilot area, almost all sixth forms and Further Education collages were offering further mathematics to their students.

Bae Caerdydd • Cardiff Bay
Caerdydd • Cardiff
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The Evaluation of the Further Mathematics Support Programme also makes a series of recommendations which my officials will be considering.

Yours sincerely

Huw Lewis AC / AM
Y Gweinidog Addysg a Sgiliau
Minister for Education and Skills

Dadansoddi ar gyfer Polisi

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Evaluation of Further Mathematics Support Programme Pilot: Final Report

Evaluation of Further Mathematics Support Programme Pilot
Final Report

Nick Miller
Miller Research (UK) Ltd

Views expressed in this report are those of the researcher and not necessarily those of the Welsh Government

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Contents

List of figures and tables

Glossary of acronyms

A2	An examination which, in combination with an AS, forms a full A Level qualification
AES	Advanced Extension Award
AS	Advanced Subsidiary (A standalone qualification that also forms half of a full A Level qualification)
FEI	Further Education Institution
FMSP	Further Mathematics Support Programme
HEI	Higher Education Institution
HESA	Higher Education Statistics Agency
JCQ	Joint Council for Qualifications
LLWR	Lifelong Learning Wales Record
MEI	Mathematics in Education and Industry
PLASC	Pupil Level Annual School Census
STEM	Science, Technology, Engineering and Mathematics
STEP	Sixth Term Examination Paper
WED	Welsh Examinations Database
WIMCS	Wales Institute of Mathematics and Computational Sciences

1 Introduction to the report

1.1 This is the second of two reports from an evaluation of the Further Mathematics Support Programme (FMSP) pilot for Wales. The first (interim report) published in December 2013[1] set out findings from a process evaluation of the pilot and early indications of its impact. In that report it was recognised that the limitations of a short time series of relevant data, prevented robust conclusions being drawn, highlighting the need for a further, desk-based, review when a further years' data became available. This second report builds on the interim report, by presenting analysis of the more-up-to date data, and is intended to be read in conjunction with it.

1.2 This final report utilises an update of the available data to provide a more robust analysis of the outcomes and emerging impacts of the FMSP pilot. It provides further evidence, based on full GCE A Level examination data for 2012-13 and updated statistics for the numbers of undergraduate students studying science, technology, engineering and mathematics (STEM) subjects at UK universities. It also includes new data relating to participation by institutions and students in the pilot, and to the performance of students by gender for both schools and further education colleges in the pilot area and Wales as a whole.

1.3 The earlier interim report also provides comprehensive details about the background to the FMSP pilot, the approach and methodology to the study.

[1] http://wales.gov.uk/statistics-and-research/evaluation-further-mathematics-support-programme-pilot/?lang=en

2 Key findings and recommendations from the study

2.1 This section of the report presents an overview of the main findings of the updated evaluation. The detailed findings of the process and early impact evaluation were presented in the interim report[2]. The detailed findings underpinning the final impact evaluation findings are expanded upon in chapter 4, Outcomes and Impact, beginning on page 20, below.

Process issues

2.2 The interim evaluation report showed that stakeholders felt that the programme has been managed effectively and prudently, with a very hands-on, committed team. An active management committee reported feeling engaged with the project and other stakeholders were highly complementary of the approach taken to date.

2.3 Schools and colleges engaged with the FMSP. The pilot's stakeholders and management committee members were generally very positive about the pilot approach of providing a number of different 'routes' for pupils (and their teachers) to support them to achieve a further mathematics qualification. The evidence showed that pupils were able to access the most effective support to match their individual circumstances.

2.4 Awareness-raising has been underpinned by a thorough programme of publicity, backed by attendance at events and extensive personal contacts from the project team. Mathematics teaching staff in target schools generally had a good awareness of the pilot. Some stakeholders, however, were not sure how well the project has succeeded in engaging parents.

2.5 Student tuition was well received, despite the project having to charge a non-recoverable fee of more than £200 per student to schools. Face-to-face tuition was highly rated, especially when easily accessible to students, and

[2] http://wales.gov.uk/statistics-and-research/evaluation-further-mathematics-support-programme-pilot/?lang=en

online support was also appreciated, despite some issues of scheduling and student access. There were some concerns about the quality of support through the medium of Welsh, especially in terms of the delivery of enrichment events and the availability of tutors. In some areas, support through the medium of Welsh was not available and students used to being taught in Welsh felt uncomfortable using English terminology for complex concepts.

2.6 Face-to-face tuition was clearly the preferred method of teaching and learning amongst those interviewed, though teachers also spoke warmly of the added value offered by online materials, especially past papers and revision exercises. However, students were not always aware that resources they were using had originated on the FMSP site.

2.7 The general FMSP website was felt to be in need of further refreshment, in order to make it more engaging and broaden its appeal beyond those already committed to further mathematics.

2.8 Enrichment events were a very popular element of the pilot, comprising events targeted at KS4 Pupils and post-16 students, mathematics master classes held in university buildings, careers talks in schools and colleges and revision days in Swansea and Pembrokeshire. The inclusion of careers talks for pupils in years 10 and 11 and master classes for year 9 pupils were especially well received for their role in building pupils' interest in studying mathematics and STEM subjects at a higher level. The revisions sessions were also used as refresher courses by staff who had not been involved in teaching further mathematics for some time.

2.9 There is no one element of the pilot that has brought individual success, but it is the integrated approach to support that was valued by teachers and students alike

Monitoring and reporting

2.10 Currently the quarterly reports compiled by the FMSP team present an overview of school and college registrations to date and the provision of further mathematics by type of delivery setting, summary of recent and planned events, promotional activities and future priorities. However, the

information lacks benchmarking or reference to desired outcomes of the pilot, and details are not collected about the staff who are able to teach further mathematics in the supported schools.

Value for money

2.11 Assessing value for money of a pilot programme can be challenging, given the extent of capacity building and initial programme development entailed, in addition to the delivery of support for further mathematics itself. Measures to assess value for money were explored as part of the evaluation, but it was decided that narrow outcome measures such as additional attributable examination outcomes per pound invested did not adequately represent the overall value of the pilot and would be misleading.

Progress against outcomes

2.12 The FMSP was set six key outcomes at the start of the pilot. Although there is not yet sufficient time-series data to draw robust, long-term conclusions, the majority of outcomes have been achieved, at least in part. The evidence from the evaluation, as to how far these have been achieved is set out below.

Outcome 1: Increased numbers of students in the pilot area studying Further Mathematics at GCE A/AS levels, over the life of the pilot.

2.13 There has been a clear increase in the number of students undertaking A Level Further Mathematics in the pilot area, although the data is less conclusive in relation to AS level at present[3]. Northern Ireland was chosen as a suitable counterfactual comparison to Wales, as no discrete further mathematics support initiative has taken place there (unlike in England), and it has a similarly structured post-16 education system to Wales (unlike Scotland). Whilst examination entries have clearly increased in the pilot area and in Wales to a lesser extent, figures have not changed in Northern Ireland.

[3] AS (Advanced Subsidiary) is the first half of a full A Level course, and is usually studied during year one of a two-year A level course. Students with an AS level pass who do not wish to continue to the full A level may 'cash in' their AS level, receive a certificate and include it in their list of qualifications attained.

In Wales, there has also been an increase in the numbers of students studying mathematics, although the rate of increase has been lower than that for further mathematics.

2.14 Data from FMSP registrations shows a year on year increase in the number of students studying further mathematics at both AS and, with the exception of a very small decrease in 2013, at A Level in the pilot area. Lifelong Learning Wales Record (LLWR) data and Welsh Examinations Database (WED)[4] data on examination entries shows a sharp rise in the level of A2 Level entries since the beginning of the pilot, increasing four-fold from 21 in 2010 to 105 in 2011 before falling back slightly to 88 in 2013. There was also an increase across Wales during that period, where the number of A2 entries more than doubled from 142 in 2010 to 281 in 2013. However, whilst the FMSP registrations show an increase in AS level entries in the pilot area, this is not reflected in the LLWR and WED data, which shows 50 entries in 2010, falling to 31 in 2011 before increasing to 46 in 2013. There is a known issue which may account for the lack of consistency between the FMSP data and the examinations data; only AS Levels which have been "cashed in" (that is the qualification has been claimed and a certificate awarded) appear within the WED database. Where the student continues to study for the A2 paper, or wishes to re-sit some AS level modules, the AS level would not be 'cashed in' and would not appear within the WED.

2.15 If the proportion of examination entries in further mathematics is looked at as a proportion of entries in mathematics, there has been a relative increase in the pilot area, against the rest of Wales.

2.16 Importantly, there are also emerging signs of an increase in further mathematics attainment levels, especially at A Level; both in terms of passes at grades A*-E and at the highest levels (A*A) in both the pilot area and the rest of Wales. In terms of passes at the highest levels (A*A), between 2010

[4] WED provided details of examination entries and attainments in schools. LLWR provided details of entries and attainments in FE colleges. More details of the datasets used and the methods of analysis are provided in the interim report.

and 2013, attainments in the pilot area increased more than four-fold (from 11 to 48) and in the rest of Wales by more than half (from 69 to 105).

2.17 However, whilst further mathematics entries from both genders have increased in the pilot area, the proportion from females reduced between 2010 and 2013, although data for 2013 shows a slight reversal of the sharp fall in the proportion of female entries in 2012. This would indicate that the pilot has been more successful in engaging male than female students.

Outcome 2: More schools and colleges in Wales offering Further Mathematics, either individually, or via consortia.

2.18 On this measure, good progress has been made in the pilot area: In 2010, 21 out of 32 school sixth forms and FE colleges in the pilot area offered further mathematics. By February 2014, this number had increased to 25 out of 29 centres in the area[5].

2.19 The number of centres delivering further mathematics in a classroom setting (either timetabled or at lunchtime / after school) rose from 16 in 2010 to 24 by 2013, but fell back slightly to 21 in 2014. Over the same period, the number of schools without classes, but with a single supervised student or up to two unsupervised students fell from five to two.

2.20 Whilst not all schools were actually offering further mathematics by 2013, the FMSP secured registrations from all sixth form centres in the pilot area by 2013, along with the majority of 11-16 schools in the region[6].

Outcome 3: Increased numbers of mathematics teachers in Wales who are trained to teach further mathematics.

2.21 There is no clear means of measuring the "stock" of teachers qualified to teach further mathematics in Wales and so this outcome could not be assessed effectively in the course of the evaluation. Delivery of continuous

[5] Mergers of two colleges into one and four sixth forms into two brought about the reduction in total centres from 32 to 29.
[6] None of the 11-16 schools and not all of the 11-18 schools that were registered with FMSP delivered GCE A Level Further Mathematics tuition.

professional development (CPD) for teachers was not part of the original pilot programme and online support was introduced in 2013.

2.22 Unlike the programme in England, the pilot FMSP in Wales did not initially include specific resources to address CPD issues; relying instead on the online resources available on the Mathematics in Education and Industry (MEI) website. The call for teacher CPD within the pilot area led to the start of Live Online Professional Development from October 2013, which has already proved a very popular resource. A wider CPD programme is now in preparation, underpinned by a brief survey seeking teacher's views about CPD for Mathematics.

2.23 Whilst no data is available about further mathematics qualification levels amongst teachers, details about qualifications to teach mathematics itself may provide clues as to the importance of mathematics in the curriculum. The number of all secondary teachers trained in mathematics and registered with GTCW increased from 1,204 in 2009 to 1,469 in March 2014, accounting for 10 per cent of all teachers by that date[7] and second only to the number of English teachers (10.4 per cent of the workforce). The data shows that 76 per cent of those teaching mathematics at secondary level[8] were known to be trained in the subject; the highest for any subject area. Further, the number of newly qualified mathematics teachers registered with GTCW increased from 70 in 2009 to 84 in 2013, before falling back slightly to 75 in 2014 and accounting for 12 per cent of the total at that time; the largest proportion of any subject specialism apart from English.

Outcome 4: Overall raised awareness among students and their parents of the importance of studying mathematics at higher levels.

2.24 The interim evaluation report set out that evidence of awareness of the opportunities offered by studying further mathematics is difficult to find,

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[7] http://www.gtcw.org.uk/gtcw/images/stories/downloads/Annual%20Statistics%20Digest/Annual_Stats_14_E.pdf

[8] In English medium schools. http://www.gtcw.org.uk/gtcw/images/stories/Statistics/Welsh__English_Medium_Schools_Comparison_February_2014_E.pdf

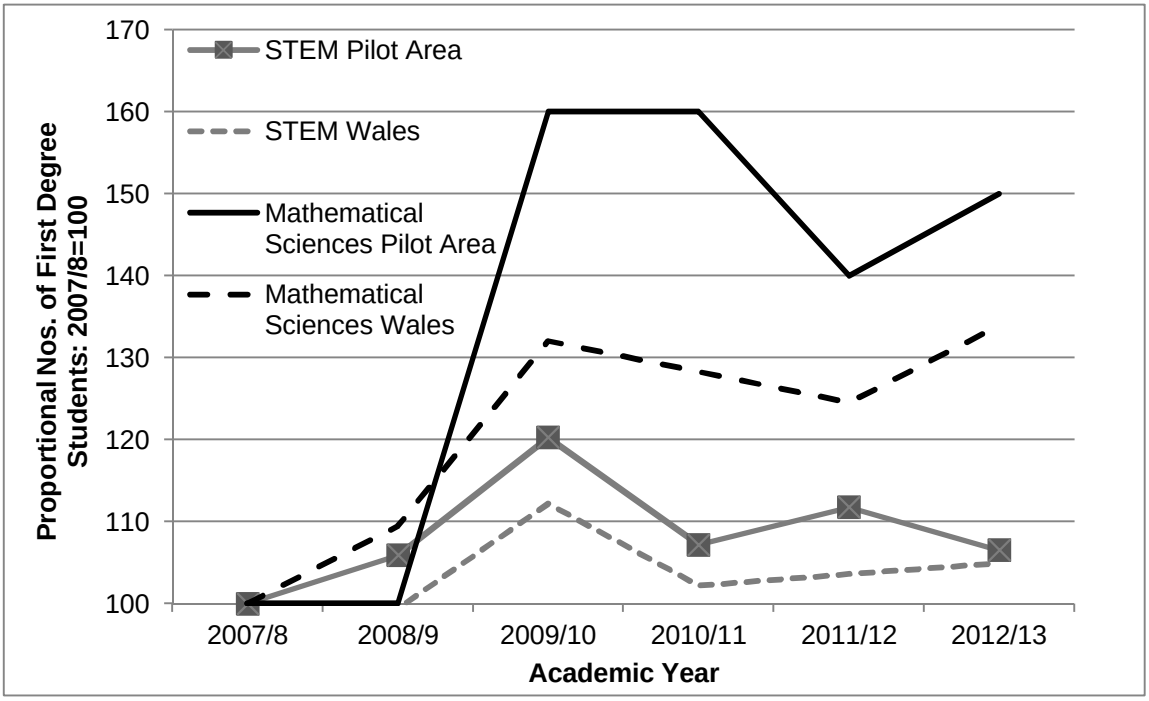
although interviews with students and teachers suggested a general understanding of the potential of the subject to support higher level study. The increased take up of further mathematics AS/A Level provision and increased applications for undergraduate further mathematics and STEM courses corroborates this.

Outcome 5: Increased numbers of students from Wales applying to study higher education courses in mathematics and related subjects, such as engineering and physics.

2.25 Higher Education Statistics Agency (HESA) data shows a clear increase in the number of enrolments to mathematics courses from the pilot area over the last four years; from 50 in 2007-8 to 75 in 2012-13[9]. This 50 per cent increase in mathematics enrolments from the pilot area outstripped the growth from Wales as a whole, which was 34 per cent, although the increased rate of growth began before the pilot commenced and the data appears quite volatile. Between 2007-8 and 2012-13, enrolments onto STEM subjects increased from 1,530 in 2007/8 to a peak of 1,840 in 2009/10 before falling off to 1,630 by 2012/13.

[9] In the interim evaluation report, figures for Welsh domiciled students in all years of undergraduate degrees were used. This report uses improved data for first year students only, reflecting the changes since the beginning of the pilot more clearly.

Figure 1. First Year, First Degree Students Domiciled in SW Wales / Wales on Mathematical Sciences / STEM Courses in UK HEIs, 2007-2013[10]



Source: Welsh Government / HESA 2014

2.26 According to Universities and Colleges Admissions Service (UCAS) Data[11] there is significant variation by country in the proportion of 18 year olds applying to university across all subjects. In 2014, 47 per cent of 18 year olds from Northern Ireland applied, whilst the figures for England, Scotland and Wales were 35 per cent, 31 per cent and 30 per cent respectively. Hence, although the rate of Welsh students enrolling on mathematics courses expressed as a proportion of all subjects was broadly in line with that of English students, the overall rate of Welsh 18 year olds applying for mathematics subjects still lies below those of students from England[12].

[10] Enrolments indexed back to 2007/8 using 2007/8 figure as base=100.
[11] Applicant statistics, (interim) May 2014: UCAS Analysis and Research.
[12] UCAS figures on admissions

Table 1. Applications for Mathematics and Stem Subjects at UK Universities.

Academic Year		2010	2011	2012	2013
Applications as a proportion of18 year olds percentages					
STEM Applications	Wales	*93*	*102*	*103*	*110*
	England	*92*	*83*	*87*	*80*
Mathematical Sciences Applications	Wales	*4.1*	*3.9*	*3.9*	*4.4*
	England	*4.5*	*4.7*	*4.5*	*4.9*
All Subjects	Wales	*230*	*240*	*240*	*240*
	England	*290*	*300*	*270*	*290*

Source: UCAS (June 2014 Deadline) / ONS Mid-year Population Estimates for 18 year olds.
Note; Applicants can apply for more than one course and may be ages other than 18.

2.27 Wales experienced a 3.2 per cent increase in applications across all subjects, from 91,840 in 2013 to 94,810 in 2014[13]. This was compared with an increase at UK level of 3.6 per cent (from 2,243,190 applicants to 2,325,060).

Outcome 6: Improved transition of students from further to higher education courses in mathematics, or from courses which have a significant element of mathematics, thus benefiting the wider economy.

2.28 Fieldwork for the evaluation showed that undergraduate students were clear that transition from A Level to degree courses in mathematics, and to a lesser extent STEM subjects is made considerably easier by taking further mathematics at A/AS Level. Generally, however, this advantage is eroded after the first year of undergraduate study.

2.29 There was general consensus amongst STEM students and lecturers interviewed, that further mathematics at A Level was a clear advantage in the first year at university.

[13] file:///J:/(P-697)%20Evaluation%20of%20the%20FMSP%20Pilot/2014%20Update/june-2014-deadline-analysis-subjects.pdf

Recommendations

(i) The pilot has proved successful in building engagement in further mathematics in the pilot area and the extension to Rhondda Cynon Taf and North West Wales is to be welcomed, given the increases in engagement achieved in the original pilot area. This approach should be allowed to consolidate by maintaining support for the extended pilot, whilst considering a change of emphasis within the initial pilot area away from direct support, to building sustainability through capacity building amongst teaching staff and sixth form centres. Regional consortia should be engaged in promoting further mathematics as part of their work in improving the education offer to young people. This should include support for capacity building in all areas of Wales, ensuring training for continuous professional development (CPD) is available as a minimum.

(ii) The full breadth of support should be continued where possible within the context of available resources, in recognition of the value of an integrated approach to developing awareness, engagement and support for pupils, without prioritising or discontinuing any individual elements. The report illustrates that there is existing “spillover” of benefits into regions of Wales beyond the pilot area and a withdrawal of support would have wider impacts than on the pilot area alone.

(iii) More needs to be done to continue to promote further mathematics to female students and encourage them to take further mathematics at AS/A2 level, as the gender gap in examination entry levels increased during the period up to 2012, despite indications at an all-Wales level of improvements in 2013. Actions could include enrichment events targeted at female students, presenting case studies and using gender-specific materials

(iv) Attention needs to be paid to the quality of provision, support and online revision materials in the medium of Welsh, to ensure equality of access and standards to all students in Wales. The content of materials should reflect developments in the syllabus that are due to be made in the near future.

(v) The evaluation has shown the importance at an institutional level of school principals and senior management team members promoting further

mathematics provision – not least because of the financial implications of support. Brokerage work, involving the FMSP team and regional consortia, targeted at this senior level could help to build commitment and embed further mathematics in a sustainable manner.

(vi) It is imperative that continuous professional development (CPD) continues to be incorporated more fully into the FMSP in Wales. The clear demand for online resources provides compelling evidence of need, which can be built upon through current research by the FMSP team. Research with teaching staff has revealed a widespread lack of confidence at best and in many cases staff have not received training in delivering further mathematics at AS/A Level. Future CPD should incorporate a module on use of online resources, to enable more effective use to be made of these. The accreditation of CPD, for example, as credits towards a MEd or similar could be investigated with relevant HEIs. Collection of data by the FMSP project team relating to the number of teachers qualified to teach further mathematics would allow for tracking of progress and this should be considered.

(vii) Collaboration and networking across schools should be encouraged to share resources beyond the formal collaboration resulting from the Regional Learning Partnership and 14-19 Partnership arrangements. In particular, any actions to increase levels of face to face tuition at convenient times and locations would be welcomed by practitioners and students alike.

(viii) The project management and delivery of the pilot have been acknowledged as generally very effective. The quality and clarity of progress reporting has been reviewed, to build understanding of the achievements of the pilot and of where barriers to success occur. However, there is room for more consideration of progress towards all programme targets, following the pattern suggested in this report, to clearly present activities delivered by quarter, progress against outcomes and future plans and priorities. Securing meaningful monitoring data will mean some additional collection and analysis of data by FMSP, Welsh Government and regional consortia, most notably:

a) Monitoring outcomes in schools and colleges supported by the pilot, in relation to entries at AS and A Level and attainment levels achieved. (Responsibility: Regional consortia) ;

b) Qualitative monitoring by learning providers of the perceptions and experiences of beneficiary students, using a standardised online questionnaire that can build from year to year (Responsibility: Learning providers);

c) An annual statistics report from LLWR and WED on AS/A Level Further Mathematics and Mathematics entries by gender, pilot/non-pilot area(s) and consortium area. (Responsibility: Welsh Government);

d) GTCW Data for teachers qualified to teach mathematics and proportion of teachers delivering mathematics who are trained in their subject. (Responsibility: FMSP);

e) Number of staff qualified to teach further mathematics in the pilot area, consortium areas, and Wales as a whole. There is not dataset for this at present and it may need to be taken on as a research exercise by the Regional Consortia, recognising that some teachers may be qualified for certain modules only. (Responsibility: Regional consortia);

f) An annual compilation of HESA data for first year, Welsh domiciled students at UK HEIs enrolled on mathematics and STEM subjects, again by pilot/non-pilot area, consortium area and all Wales. This will need to be drawn from raw HESA data as a separate analytical exercise. (Responsibility: Welsh Government). It may be worth considering monitoring UCAS applications, as well as enrolments, to understand any lessons in terms of the success rate of applications for further mathematics against other subjects (Responsibility: FMSP / Regional consortia); and:

g) A comparison of JCQ data for AS/A Level entries in Wales, England and N Ireland, along with an exploration of whether detailed data can be secured from comparator nations for 17/18 year olds in maintained settings. (Responsibility: FMSP / Regional consortia / Welsh Government);

(ix) The FMSP Website should be further updated and enhanced, to provide a more effective marketing and engagement tool for the pilot and a stronger identity for support in Wales. More work could be done to alert teachers to the breadth of materials available on the site; possibly including a quick guide to what is available. (Responsibility FMSP);

(x) Where online activities are provided, their availability requires greater promotion and publicity, and they must 'work' in terms of easy, straightforward connectivity. Timing of sessions also requires more consideration. (Responsibility: FMSP);

(xi) Finally, there is a vulnerability in the pilot, in that it has substantially relied on the high level of commitment and support from the programme leader. Plans for any future investment will need to be mindful of the critical nature of this role and a succession plan needs to be formulated as a matter of urgency. (Responsibility: FMSP);

3 Background to the Evaluation

3.1 The FMSP initially covered Carmarthenshire, Neath Port Talbot, Pembrokeshire and Swansea and the Welsh Government originally intended that it run between July 2010 and October 2013. In early 2013, the decision was taken to expand and prolong the pilot and from April 2013, FMSP support was also provided in Anglesey, Conwy, Gwynedd and Rhondda Cynon Taf. At this time the pilot programme was extended to March 2014. Following publication in December 2013 of the interim report, the Minister announced that more funding would be made available to consolidate and continue the programme up to April 2016.

3.2 Like the interim report, this final report focuses on the initial pilot area in SW Wales and its impacts on students from the region.

3.3 The pilot was initially funded to a total of £581,485 between 2010 and 2014 from Welsh Government and has been managed by the Wales Institute of Mathematical and Computational Sciences (WIMCS). The additional funding to extend the programme to April 2016, was for £225,000 and took the total funding provided since 2010 to £806,485.

3.4 Support offered to schools and colleges through the FMSP Wales includes:

Student tuition for AS/A Level Further Mathematics;

Free single user teacher access to the Mathematics in Education and Industry (MEI) Resources Website (supporting all AS/A2 Level Further Mathematics specifications plus Additional Mathematics and GCSE extension resources);

Mathematics enrichment courses for students in Key Stage 4 and post-16, such as mathematics master classes, mathematics career talks and revision events;

AS and A2 Mathematics and Further Mathematics Revision Days.

The evaluation

3.5 The evaluation set out to provide an assessment of both the process and impacts of the pilot programme to date and the extent to which it is meeting its objectives. Approaches to the counterfactual (i.e. what would have happened in the absence of the pilot) were trialled, using spatial comparisons, (pilot area vs. Wales, England and Northern Ireland) and time series (pre-pilot and during pilot). In November 2013 the project steering group took the decision to publish the findings relating to the process evaluation and evidence of early impact, in the form of an interim report. The group also agreed to extend the evaluation period for a further nine months to allow for updates to student participation, attainment and progression data to be incorporated in this final report.

4 Detailed findings: Outcomes and impacts

4.1 The specification for the FMSP identified six outcomes to be achieved by the end of the pilot. These were all comparative targets, relating to **increases** in provision and participation, rather than hard numeric targets against a baseline position.

4.2 The outcomes were:

Outcome 1: Increased numbers of students in the pilot area studying further mathematics at GCE A/AS levels, over the life of the pilot

Outcome 2: More schools and colleges in Wales offering further mathematics, either individually, or via consortia

Outcome 3: Increased numbers of mathematics teachers in Wales who are trained to teach further mathematics

Outcome 4: Overall raised awareness among students and their parents of the importance of studying mathematics at higher levels

Outcome 5: Increased numbers of students from Wales applying to study higher education courses in mathematics and related subjects, such as engineering and physics

Outcome 6: Improved transition of students from further to higher education courses in mathematics, or from courses which have a significant element of mathematics, thus benefiting the wider economy.

4.3 In this section of the report, we examine the progress made against each outcome, within the constraints of available data and draw some conclusions about the overall efficacy of the pilot. This analysis builds on that in the interim report, through:

additional FMSP data for participation in further mathematics,

all 2013 attainment data for AS/A2 examinations,

HESA data for Welsh-domiciled, first year undergraduate students on STEM related courses in 2013-14 and,

the latest data on qualifications of teachers in Wales

Outcome 1: Increased numbers of students in the pilot area studying further mathematics at GCE AS/A2 levels, over the life of the pilot.

4.4 There is a stark disparity in data between the numbers of students recorded by FMSP as studying for AS/A2 examinations in further mathematics and the data returns held in the LLWR and WED for the number of examination entries and attainments. Whilst no clear explanation is available, it is likely that some students' AS Levels are not counted in their own right, but they are combined with A2 results as part of their A Level qualifications, which are then recorded in entry and attainment data returns. At the same time, some students are likely to embark on an AS or A2 further mathematics course without entering for the exam, but instead to boost their grades in mathematics (where there are common modules across the two subjects, such as Mechanics 2 or Statistics 2[14]) and others will not complete the course due to workload.

4.5 Data from FMSP shows that there were 60 students studying A2 Further Mathematics and 129 students studying AS in Years 12 or 13 in state-funded sixth forms or FE in the pilot area in 2010-11. By 2013-14, this had increased to 97 A2 Level and 168 AS Level students studying further mathematics in the region.

Table 2. Students Studying Further Mathematics: AS/A2 Levels, 2010-14

Year	AS	A2	Total
2010-11	129	60	189
2011-12	164	66	230
2012-13	169	101	270
2013-14	168	97	265

Source: FMSP Registration Data

4.6 Whilst the available sources of data do not provide comprehensive and reliable figures for both the pilot area and Wales, and it is therefore not

[14] Mechanics 2 and Statistics 2 are optional papers in Mathematics A level and in Further Mathematics AS level. These papers are a requirement for Further Mathematics A level. An example of syllabuses for these qualifications is available on the website of the WJEC: http://www.wjec.co.uk/qualifications/qualification-resources.html?subject=Mathematics&level=GCEASA

possible to be certain about the total number of students *studying* further mathematics, a worthwhile proxy is the number of examination *entries* at AS/A2 Levels, taken from the LLWR for FE students and WED for school sixth form pupils. Table 3 below shows the change in entries over time in the pilot area, demonstrating an increase in A2 entries from 17 in 2007-8 to 88 in 2012-13, change in AS Level entries from 17 in 2007-8 to 46 in 2012-13, and changes in combined AS/A2 entries from 34 in 2007-8 to 134 in 2012-13, albeit with large fluctuations in numbers between these dates. However, these 134 entries were in the context of 265 students said to be studying within the pilot area.

Table 3. Further Mathematics Entries at AS/A2 Levels: Pilot Area FE and Schools 2008-2014

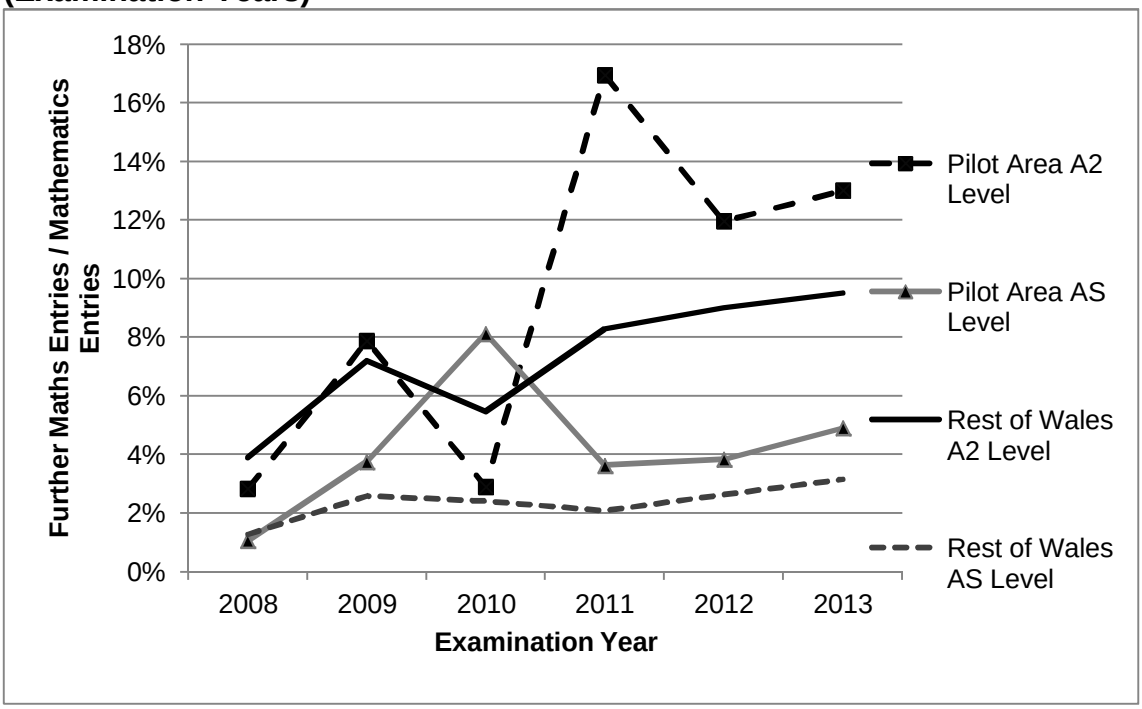
Examination Years		2008	2009	2010	2011	2012	2013
A2 Level	FE	10	30	7	87	61	60
	Schools[15]	7	24	14	18	26	28
	Total	17	54	21	105	87	88
AS	FE	10	31	47	28	27	39
Level	Schools	0	1	3	3	7	7
	Total	17	32	50	31	34	46
AS/A2	Total	34	86	71	136	121	134

Source: LLWR / WED. WED Data for state schools. LLWR A Level data for 17-18 year olds and AS Level data for 16-17 year olds.

4.7 Another approach to looking at changes in the rate of Further Mathematics entries is to take, from the most reliable sources available (WED and LLWR), further mathematics examination entries as a proportion of mathematics entries and to explore changes over time.

[15] Excludes independent schools

Figure 2 Further Mathematics Entries as a Proportion of Mathematics Entries: A2 and AS Levels: Pilot Area vs. Rest of Wales 2008-2013 (Examination Years)

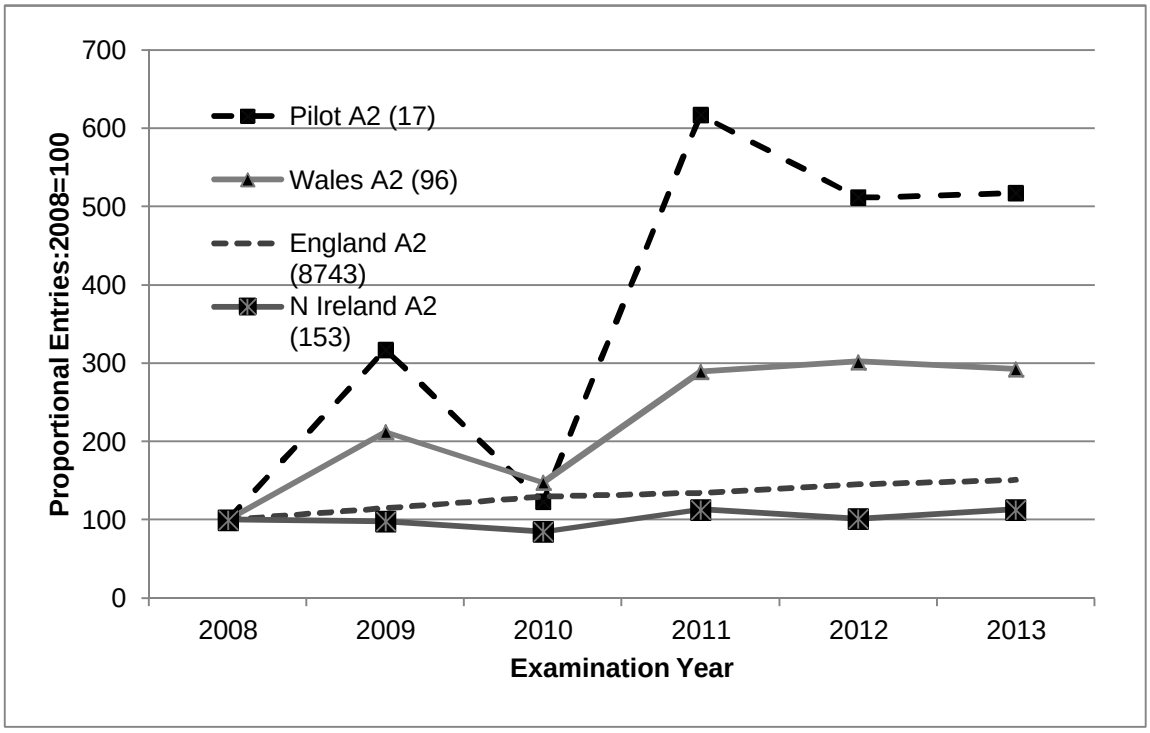


Source: LLWR / WED/ Miller Research

4.8 As before, this shows a step change in the proportion of A2 Level Further Mathematics entries in 2011 in the pilot area and a consistently higher proportion of further mathematics entries at AS Level than in the rest of Wales from 2009 onwards. It is notable that entries had already begun show limited signs of increasing before the pilot FMSP commenced.

4.9 Given that the FMSP has engaged with a substantial number of schools outside the pilot area and that this may have impacted on engagement levels, it may be more illustrative to compare changes in examination entries with Northern Ireland, where no support for further mathematics is in place and England, where long term support has been in place. Figure 3 shows how the rate of entries as a proportion of the 2008 baseline, has since changed in each UK country.

Figure 3 Further Mathematics: A2 Entries: Pilot Area vs. Wales, Northern Ireland and England 2008-2013 (Examination Years. Indexed to 2008)



Source: JCQ for Wales, England N Ireland. WED/LLWR for Pilot Area. Figures in brackets are entries for 2008. Note JCQ data includes independent schools, other settings and all ages, WED/LLWR data are for 16 and 17 year olds in maintained settings only.

4.10 This shows that whilst levels of engagement in further mathematics remained relatively constant in Northern Ireland over the period and England experienced a gradual rise in numbers, there was a substantial increase in engagement in the pilot area in the period 2011 to 2013, and a smaller rise in engagement in the rest of Wales. The rate of A2 Further Mathematics entries as a proportion of mathematics entries in Wales was 7 per cent in 2008[16] and 11 per cent in 2013, whereas in England it was 15 per cent in 2008 and 16 per cent in 2013. In Northern Ireland the proportion fell slightly over the same period from 6 per cent to 5 per cent. However, the increase in Wales should be seen in the context of starting from a low baseline, in that by 2013, there were approximately 11.0 Further Mathematics entries per 1,000 population

[16] JCQ Data. A level Further Mathematics entries, 2013: Wales=416, England=13,232. Joint Council For Qualifications Provisional GCE A Level Results - June 2013 http://www.jcq.org.uk/Download/examination-results/a-levels/a-as-and-aea-results-summer-2013

(of 18 year olds) in Wales, against a corresponding figure of 20.4 in England.[17]

4.11 The FMSP should help to increase the quality of tuition and support, as well as the numbers of students engaged. Hence the extent to which students achieve a qualification on completion of their course is also important. Data for achievements of further mathematics A*-E grades as a proportion of A*-E grades in mathematics are shown below for the pilot area and rest of Wales. These are included as a proxy for the quality of tuition in further mathematics and show indicative signs of an increase in achievements at A Level between 12 per cent in 2011 and 15 per cent in 2013 in both the pilot area and the rest of Wales, with some signs of growth (between 4 per cent and 9 per cent) in terms of AS Level data.

Table 4. Further Mathematics Attainments at A*-E as a Proportion of Mathematics Achievements; 2008-2013

Per Cent		2008	2009	2010	2011	2012	2013
A Level	Pilot Area	*3*	*8*	*3*	*12*	*12*	*15*
	Rest of Wales	*4*	*7*	*5*	*8*	*9*	*13*
	Total	*7*	*15*	*8*	*20*	*21*	*28*
AS Level	Pilot Area	*1*	*3*	*4*	*2*	*4*	*5*
	Rest of Wales	*1*	*3*	*2*	*2*	*3*	*4*
	Total	*2*	*6*	*6*	*4*	*7*	*9*

Source: LLWR / WED / Miller Research

4.12 Another variable to consider is the proportion of A* and A grades achieved in Further Mathematics. Table 5 below shows the number of A Level achievements at A*-A grades[18] in the pilot area between 2009 and 2013, along with this number as a proportion of A*-A results in the rest of Wales. In both cases, there appears to be a step change in 2011, which is broadly sustained in 2012. Students in the pilot area accounted for 23 per cent of the A*-A grades in Wales in Further Mathematics in 2008, rising to 31

[17] ONS Mid-year Population Estimates for 18 year olds: Wales=37,860, England=650,210. https://statswales.wales.gov.uk/Catalogue/Population-and-Migration/Population/Estimates/NationalLevelPopulationEstimates-by-Year-Age-UKCountry

[18] A* was only introduced as a grade option in 2010.

per cent in 2013. A more robust measure will be to see whether this level persists over the medium term.

Table 5. Further Mathematics Achievements at A*A: Pilot Area vs. Rest of Wales, 2008-2013

Numbers and percentages		2008	2009	2010	2011	2012	2013
A Level	Pilot Area Achievements, Numbers	12	26	11	40	44	48
	Rest of Wales Achievements, Numbers	41	79	69	89	115	105
	Pilot Area / Rest of Wales, %	*29*	*33*	*16*	*45*	*38*	*46*
	Pilot Area / Wales Total, %	*23*	*25*	*14*	*31*	*28*	*31*

Source: LLWR / WED / Miller Research

4.13 The data can also be analysed by the proportion of A* and A grades achieved in Further Mathematics as a percentage of A* and A grades achieved in mathematics. This can potentially control for the presence of a more able cohort of students in a given year and validate data which demonstrates an increase in the proportion of A* and A grades. As is shown in Table 6 below, the rate of A-A* in further mathematics has grown more strongly in the pilot area than in the rest of Wales, in relation to A-A* mathematics grades as well.

Table 6. Further Mathematics Achievements at A*-A as a Proportion of Mathematics Achievements at A*-A; 2008-2013

Per Cent		2008	2009	2010	2011	2012	2013
A Level	*Pilot Area*	*5*	*9*	*4*	*16*	*15*	*22*
	Rest of Wales	*5*	*9*	*8*	*10*	*13*	*11*

Source: LLWR / WED / Miller Research

4.14 The data post-2011 appears to validate a proportional increase in achievement of top grades at A Level, with particular growth in the pilot area in 2013, in contrast to a slight fall in the rest of Wales.

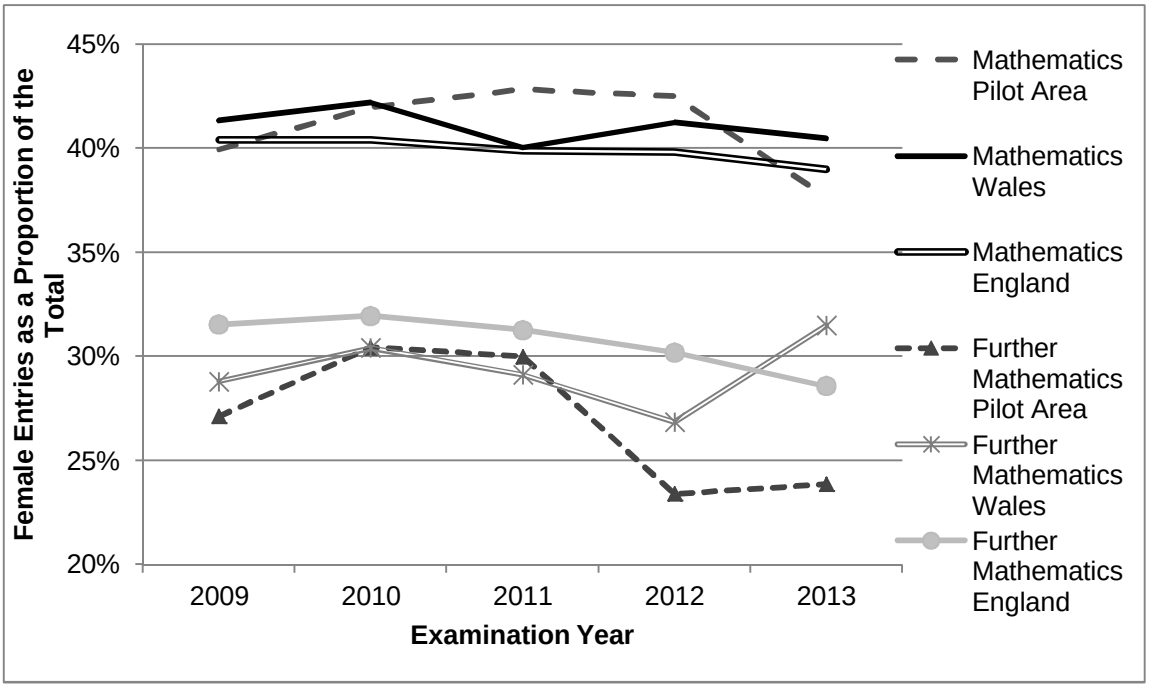
4.15 Equality by gender was also explored. In the pilot area, female students accounted for only 24 per cent of A Level Further Mathematics entries in 2013 and the interim evaluation showed that the relative proportion of

female further mathematics A2 entries in the pilot area has fallen as overall numbers have risen in association with interventions from the pilot.

4.16 When comparing the proportion of female further mathematics entries to female maths entries, a similar pattern can be seen. Female participation in Mathematics A2 examinations has remained relatively constant in both the pilot area and Wales as a whole[19]. The data shows that the gender imbalance in further mathematics has grown to a larger extent in the pilot area than in the rest of Wales between 2008 and 2013, suggesting that the pilot has been relatively successful in engaging male students, but may need to focus some attention on how to attract more female students into the subject. Across Wales as a whole, there was a sharp increase in the proportion of female A2 Further Mathematics entries in 2013, although this was not reflected in the pilot area. This increase follows a fall in the proportion of female entries in 2012, illustrating the volatility of the data over a short period. In England during the six years between the creation of the FMSP in 2004 and 2010, the proportionate increase in participation by female students was broadly in line with that for male students, although at a much lower level in numeric terms. However, since 2010, there has been a steady decline in the proportion of female entries for both mathematics and further mathematics in England.

[19] In the pilot area, female entries accounted for between 38 and 43 per cent of all mathematics A Level entries between 2009 and 2013, whilst in Wales as a whole, the range was between 40 and 42 per cent.

Figure 4. Further Mathematics and Mathematics A2 Examinations: Female Entries as a Proportion of Total for Pilot Area, Wales and England



Source: LLWR / WED (for Pilot Area and Wales) / JCQ (for England). Note the LLWR/WED and JCQ datasets are not strictly comparable, as discussed earlier in this report.

4.17 Finally, the interim evaluation report suggested that the data could be used to explore whether, due to the FMSP, an increase in the numbers of students with lower grades at GCSE[20], or those living in deprived areas, participating in further mathematics might be observed. However it was found that this analysis would require data linking work to create individual-level records for further mathematics students, their GCSE scores and postcode-related deprivation information from the Welsh Index of Multiple Deprivation. Such linking work was beyond the scope of this project.

[20] Or equivalent.

Outcome 2: More schools and colleges in Wales offering further mathematics, either individually, or via consortia.

Schools and colleges engaged

4.18 When the pilot began in 2010, it was identified that there were 27 secondary schools with sixth forms in the pilot area, of which 13 were English medium maintained schools, 11 were Welsh medium maintained schools and three were independent. There were five further education colleges to begin with, but the merger of Gorseinon and Swansea Colleges in 2010 to form Gower College reduced this to four. Also, in 2012, the number of school sixth forms was reduced to 25, following the merger of four sixth forms into two.

4.19 The FMSP had secured registrations from all maintained sixth form centres (in schools and colleges), from the majority of 11-16 schools, and three out of four independent schools in the pilot area by 2013. Table 7 shows the coverage in March 2014.

Table 7. Coverage of FMSP in the Pilot Area, March 2014

School Categories		Schools/colleges in the Pilot Area				
		Carmarthen shire	Neath Port Talbot	Pembroke-shire	Swansea	Total
Total schools in the area	11-16 schools	5	9	0	7	21
	11-18 schools	8	2	8	7	25
	FE Colleges	1	1	1	1	4
	Independent schools	2	0	1	1	4
	Total	16	12	10	16	54
FMSP Wales Registered	11-16 schools	4	5	0	7	16
	11-18 school	8	2	8	7	25
	FE Colleges	1	1	1	1	4
	Independent Schools	2	0	1	0	3
	Total	15	8	10	15	48

Source: FMSP

4.20 In addition to schools and colleges in the original pilot area, by March 2014, FMSP had secured a further 23 registrations from schools in the extended pilot area, incorporating Anglesey, Gwynedd, Conwy and RCT.

There were also 69 registrations from sixth form centres in other parts of Wales.

4.21 Table 8 shows the change in both the number of sixth form centres in schools and colleges in the pilot area between 2010 and 2014, and the growth in the number and proportion of these delivering further mathematics. In 2010, there was provision in 21 out of 32 centres, whilst in 2013 the proportion had changed to 25 out of 29 centres.

Table 8. Number of Schools with Further Mathematics Students in the Pilot Area in 2010 - 2014

	2010	2013	2014
No. of school sixth forms in the pilot area	27	25	25
No. of FE colleges in the pilot area	5	4	4
No. of school sixth forms with FM students	16	22	21
No. of colleges with FM students	5	4	4
Proportion of centres with FM students %	*66*	*90*	*86*

Source: FMSP

4.22 Table 9 shows the change in the proportion of schools and colleges delivering further mathematics in a classroom setting (either timetabled or non-timetabled), as opposed to individual or small numbers of students taking supervised or unsupervised modules. It can be seen that the share of centres offering further mathematics classes increased from 16 out of 21 in 2010 to 24 out of 26 in 2013 before falling back slightly to 21 out of 25 in 2014; that is both the number of centres offering provision increased overall, but the nature of the setting also changed over the pilot period.

Table 9. Further Mathematics Provision in the Pilot Area in 2010 - 2013

	Oct 2010	Feb 2011	Oct 2011	Feb 2012	Nov 2012	Feb 2013	Apr 2014
Schools / Colleges with groups of students in a class (timetabled/ un-timetabled)	16	15	19	21	23	24	21
Schools / Colleges with 1 supervised student per module or up to 2 unsupervised students	5	6	3	4	3	2	4
Total	21	21	22	25	26	26	25

Source: FMSP

Outcome 3: Increased Numbers of Mathematics Teachers in Wales who are Trained to Teach Further Mathematics.

4.23 The interim report set out that data are not available to show the number of teachers in Wales who are qualified to teach further mathematics and so this outcome could not be assessed effectively in the course of the evaluation.

4.24 The only continuous professional development (CPD) for teachers that was originally included in the FMSP were online resources provided through the English website, where teachers are able to access Live Online Professional Development (LOPD) courses, covering a range of topics relating to all modules of further mathematics A/AS Level courses. Since the time of the interim report, the FMSP has begun to prepare a CPD programme, starting with the "Teaching Further Mathematics" course run by MEI. It has also created an online survey, to gauge interest in CPD provision and assess current levels of training.

4.25 Whilst no data is available about further mathematics qualification levels amongst teachers, details about qualification to teach mathematics itself may provide clues as to the importance of mathematics in the curriculum. the proportion of all secondary teachers trained in mathematics and registered with GTCW increased from 1,204 in 2009 to 1469 in March 2014, accounting for 10 per cent of all teachers by that date[21] and second only to the number of English teachers (10.4 per cent of the workforce). The data shows that 76 per cent of those teaching mathematics at secondary level were known to be trained in the subject; the highest for any core subject area. For comparison, 71 per cent of English teachers and 30 per cent of science teachers[22] were in this category. Further, the number of newly qualified mathematics teachers registered with GTCW increased from 70 in 2009 to 84 in 2013, before falling

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21 http://www.gtcw.org.uk/gtcw/images/stories/downloads/Annual%20Statistics%20Digest/Annual_Stats_14_E.pdf. No. of teachers registered by GTCW by ITET Subject trained (secondary only).

22 The lowest proportion of the core subjects. Proportions were higher for individual science subjects, however.

back slightly to 75 in 2014 and accounting for 12 per cent of the total at that time; the largest proportion of any subject specialism apart from English.

Outcome 4: Overall raised awareness among students and their parents of the importance of studying mathematics at higher levels.

Attitudes towards Further Mathematics

4.26 The interim evaluation report highlighted broad agreement amongst stakeholders and students that studying further mathematics was beneficial, both at GCE and in HE, although their most common reasons for engaging in further mathematics were a personal interest in the subject, the benefit in terms of university entry requirements and building future career options.

4.27 School students were especially aware that further mathematics could help them stand out 'from the crowd', and give them a head-start on reaching University. Almost 30 per cent of surveyed students recognised the potential for further mathematics to assist in the transition from AS/A level to undergraduate study.

Outcome 5: Increased numbers of students from Wales applying to study higher education courses in mathematics and related subjects, such as engineering and physics.

4.28 HESA Data was secured from Welsh Government to show the number of first degree students from the pilot region and from Wales as a whole engaged on mathematical science or STEM courses[23] at UK Higher Education Institutions (HEIs). The number of students enrolled on mathematical science courses from the pilot area grew from 50 in 2007-8 to a peak of 80 between 2009/10 and 2010/11 before falling off to 75 in 2012-13. Over the same period, enrolments onto STEM subjects fluctuated from 1,530

[23] This study uses a definition of STEM which includes: Medicine, dentistry and allied subjects, biological and veterinary sciences, agriculture, physical sciences, mathematical sciences, computer science, engineering & technology, architecture, building and planning. A detailed list of this subject appears on the HEFCE website here: http://www.hefce.ac.uk/media/hefce/content/pubs/2014/cl022014/CL2014-02%20Annex%20A.pdf

in 2007/8 to a peak of 1,840 in 2009/10 before falling off to 1,630 in 2012/13.[24]

Table 10. First year, Welsh Domiciled Students Enrolled on Mathematics and Stem Subjects at UK Universities.

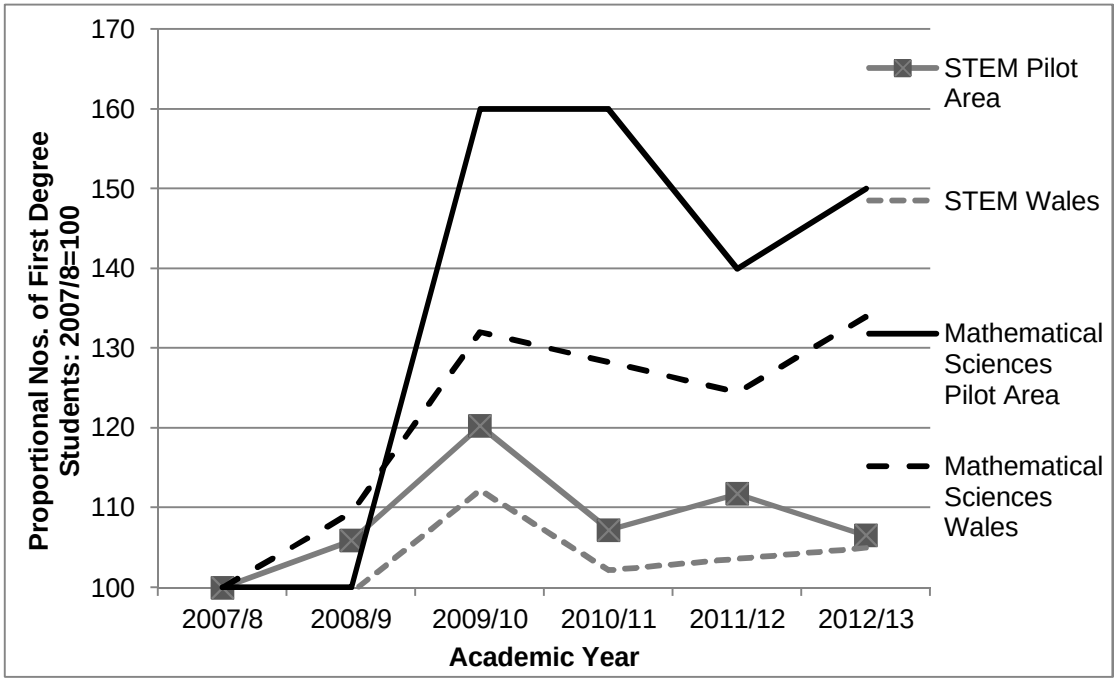
Academic Year		2007/8	2008/9	2009/10	2010/11	2011/12	2012/13
	Pilot Area	1,530	1,620	1,840	1,640	1,710	1,630
STEM	All Wales	7,080	7,035	7,945	7,235	7,335	7,430
	UK	122,665	131,825	139,695	140,660	151,685	144,215
Mathematical Sciences	Pilot Area	50	50	80	80	70	75
	All Wales	265	290	350	340	330	355
	UK	6,055	6,525	6,780	6,845	7,030	6,625

Source: HESA / Welsh Government

4.29 Hence the overall growth in pilot area mathematics students, of 50 per cent, outstripped that of Wales as a whole over the period, for which the figure was 34 per cent, although it can be seen that the increased rate of growth began before the pilot commenced, and the data appears quite volatile. Future data will be necessary to show that the trend of increased growth was sustained, or indeed sustainable.

[24] In the interim evaluation report, figures for Welsh domiciled students in all years of undergraduate degrees were used. This report uses improved data for first year students only, reflecting the changes since the beginning of the pilot more clearly.

Figure 5. First Year, First Degree Students Domiciled in SW Wales / Wales on Mathematical Sciences / STEM Courses in UK HEIs, 2007-2012



Source: Welsh Government / HESA

4.30 The growth in the number of first degree mathematics students from Wales as a whole will reflect the contribution of the pilot area, as well as any increase in student numbers from the rest of Wales. If the pilot area were removed from the Wales figures, the difference between pilot and non-pilot areas would be greater.

4.31 According to UCAS Data[25] there is significant variation by country in the proportion of 18 year olds applying to university across all subjects. In 2014, 47 per cent of 18 year olds from Northern Ireland applied, whilst the figures for England, Scotland and Wales were 35 per cent, 31 per cent and 30 per cent respectively. Although the proportion of Welsh students *enrolling* on mathematics courses[26] as a proportion of all subjects was broadly in line with that of English students, the overall proportion of young people from Wales

[25] Applicant statistics, (interim) May 2014: UCAS Analysis and Research.
[26] 2.10 per cent, England; 2.13 per cent, Wales. HESA, 2014. Whilst data on applications and enrolments is not directly comparable, it is useful to consider the comparable rate of mathematics enrolments from Welsh-domiciled student in the context of the low rate of overall applications.

applying for mathematics subjects still lies below that of young people from England. This was not the case, however, for STEM subject applications.

Table 11. Applications for Mathematics and Stem Subjects at UK Universities from students domiciled in Wales and England

Academic Year		2010	2011	2012	2013	2014
Applications, numbers						
STEM Applications	Wales	37,990	40,710	41,630	41,500	43,540
	England	745,810	805,250	772,670	811,880	863,220
Mathematical Sciences Applications	Wales	1,690	1,560	1,570	1,650	1,550
	England	30,740	31,740	30,070	31,840	31,480
All Subjects	Wales	92,270	96,010	94,580	91,840	94,810
	England	1,966,320	2,043,560	1,841,670	1,886,580	1,958,370
Population of 18 year olds	Wales	40,876	39,797	40,243	37,860	-
	England	682,632	671,694	670,895	650,210	-
Applications as a proportion of 18 year olds, percentages						
STEM Applications	Wales	*93*	*102*	*103*	*110*	-
	England	*92*	*83*	*87*	*80*	-
Mathematical Sciences Applications	Wales	*4.1*	*3.9*	*3.9*	*4.4*	-
	England	*4.5*	*4.7*	*4.5*	*4.9*	-
All Subjects	Wales	*230*	*240*	*240*	*240*	-
	England	*290*	*300*	*270*	*290*	-

Source: UCAS (June 2014 Deadline) / ONS Mid-year Population Estimates for 18 year olds.
Note; Applicants can apply for more than one course and may be ages other than 18.

4.32 There was a 3.2 per cent increase in applications from Welsh-domiciled students to UK universities across all subjects, from 91,840 in 2013 to 94,810 in 2014[27]. This was compared with an increase at UK level of 3.6 per cent (from 2,243,190 applicants to 2,325,060)

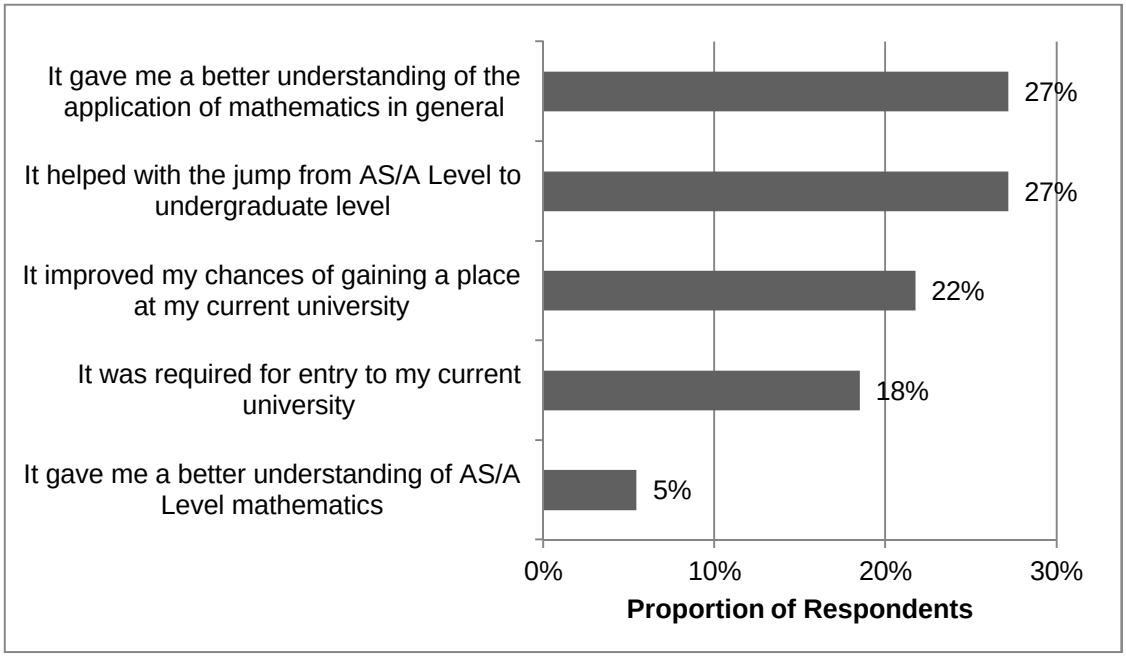
[27] file:///J:/(P-697)%20Evaluation%20of%20the%20FMSP%20Pilot/2014%20Update/june-2014-deadline-analysis-subjects.pdf

Outcome 6: Improved transition of students from further to higher education courses in mathematics, or from courses which have a significant element of mathematics, thus benefiting the wider economy.

4.33 The interim evaluation report noted that there was a general consensus that taking further mathematics at AS/A Level eased the path of transition for students going into mathematics and STEM courses. However, there were very few students or HE lecturers who felt that the difference between those with and those without further mathematics persisted beyond the first year of undergraduate study.

4.34 In the online survey of students that formed part of the research for the process evaluation in 2013, respondents identified help with the transition to undergraduate study as the joint most important advantage of studying further mathematics (27 per cent of responses), along with gaining a better understanding of mathematics in general.

Figure 6. Undergraduate Students: Main Advantage of Studying Further Mathematics A/AS



Source: Online Survey of Students. Base=93. Only single response allowed.

Longer Term Impacts

4.35 In terms of longer-term impacts, there is generic data on graduate destinations, which provides some insights into the relative position of

mathematics and STEM graduates. The data shows that mathematical science graduates are less likely than average to go into employment and more likely than average to continue on to further study, or a combination of work and further study.

Table 12. Destinations of Full-Time First Degree Leavers by Subject Area Six Months After Graduating 2011-12 (Known Destinations)

Percentages	Mathematics	STEM	All Subjects
UK work	*52*	*65*	*63*
Overseas work	*2*	*2*	*3*
Work and further study	*8*	*5*	*6*
Further study	*25*	*15*	*15*
Unemployed	*9*	*8*	*9*
Other	*5*	*4*	*5*
Total percentage	*100*	*100*	*100*

Source: HESA 2013

4.36 In terms of those who entered employment, mathematics graduates were more likely than average to secure careers in professional/associate professional roles (although less likely to become professionals than STEM graduates as a whole).

Table 13. Occupation of Full-Time First Degree Leavers Entering Employment in the UK by Subject Area of Degree 2011-12

Percentages	Mathematics	STEM	All
Managers, directors and senior officials	*3*	*3*	*4*
Professional occupations	*43*	*53*	*34*
Associate professional and technical occupations	*28*	*18*	*26*
Total professional	*74*	*74*	*64*
Administrative and secretarial occupations	*10*	*5*	*9*
Skilled trades occupations	*1*	*1*	*1*
Caring, leisure and other service occupations	*3*	*6*	*7*
Sales and customer service occupations	*8*	*9*	*13*
Process, plant and machine operatives	*0*	*0*	*0*
Elementary occupations	*4*	*5*	*6*
Total non-professional	*25*	*26*	*36*

Source: HESA 2013

4.37 Perhaps the starkest difference in terms of employment profile was in the sector of employment: mathematics graduates were very much more likely than average to be employed in the financial sector, or in the property

development, business and research sector than other graduates and very much less likely to enter health and social work, for example.

Table 14. Industry of Full-Time First Degree Leavers Entering Employment in the UK by Subject Area of Degree 2011-12

Standard Industrial Classification	Mathematics %	STEM %	All %
Agriculture, forestry and fishing	0	0	0
Mining and quarrying	1	1	1
Manufacturing	5	5	4
Electricity, gas and water supply	1	1	1
Construction	1	2	1
Wholesale and retail trade/repair(2)	12	13	17
Hotels and restaurants	4	4	6
Transport, storage and communication	11	7	8
Financial activities	21	4	5
Property development, renting, business and research activities	23	14	17
Public administration and defence/social security	3	3	4
Education	11	8	12
Health and social work	3	33	18
Other community, social and personal service activities	4	4	6
Private households with employed persons	0	0	0
International organisations and bodies	0	0	0

Source: HESA 2013

4.38 With regard to salaries, HESA Statistics show that the average salary for a mathematics graduate after six months of leaving university is £24,437[28], against an average for all graduates of £21,762. Dentistry was the highest earning degree, at £30,681 and all of the twelve highest earning subjects were STEM-related. It should be noted, however, that the setting in which graduates were employed had a significant effect on their salaries.

[28] HESA 2011-12, published May 2014, quoted in http://www.thecompleteuniversityguide.co.uk/ Figures for those in “graduate jobs”.

Value for Money

4.39 Assessing value for money of a pilot programme can be challenging, given the extent of capacity building and initial programme development entailed, in addition to the delivery of support for further mathematics itself. Measures to assess value for money were explored as part of the evaluation, but it was decided that narrow outcome measures such as additional attributable examination outcomes per pound invested did not adequately represent the overall value of the pilot and would be misleading, because for example, it would overlook the additional benefits realised in terms of increased entry levels in Wales outside the pilot area and impacts on increased recruitment onto mathematics courses, or engagement of pre-16 pupils. Within the pilot area, the programme has delivered extensive benefits beyond examination entries, in terms of increased numbers of students studying further mathematics, awareness raising and encouragement of students to undertake mathematics and STEM subjects at a higher level, plus capacity building amongst teachers.

Enterprise and Business Committee

Inquiry into Tourism

Engagement event with stakeholders
Llechwedd Slate Caverns, Blaenau Ffestiniog – Thursday 18 September 2014

Purpose

The aim of this event was for Members of the Enterprise and Business Committee to hear the views and experiences of local tourism businesses.

The event was split into three groups, each consisting of local tourism businesses and Assembly Members. Group 1 consisted of the following people:

Joyce Watson AM (Chair)
Suzy Davies AM
Michael Bewick (Llechwedd Slate Caverns)
Jana Jones (Attractions of Snowdonia)
Ceri Cunnington (Antur Stiniog)
Jennifer MacDonald (Welsh Mountain Zoo)

Summary of the main points made

Infrastructure problems

- Mobile phone and broadband coverage must be improved. Nowadays most tourism businesses rely upon online bookings, which are often made using mobile devices.
- North-south transport links need to be improved.
- There is not enough good signage to direct tourists to attractions. However, the situation regarding brown tourism attraction signs has improved.

Visit Wales and Visit Britain support

- Regional Tourism Partnerships were a mixed success. One of their strengths was that they provided an opportunity for tourism businesses from different sectors to get together. However, they seemed to duplicate some of the branding work done by other agencies.
- The transition from Regional Tourism Partnerships to a new model of regional support could be positive, depending on how it is done.
- Research produced by Visit Wales is useful, and helps to create business cases needed for investment. Further impartial research would be welcomed.
- Capital support from Visit Wales (for example, for mountain bike trails) has been very helpful.
- Visit Wales is good at business support.
- Visit Wales' marketing aims are not communicated well with local stakeholders. Local businesses have not been approached to feed into the "Have you packed for Wales?" campaign. Stakeholders were also disappointed that only one attraction from north Wales featured in this advert.
- Visit Wales seems Cardiff-focussed – e.g. local businesses are not made aware of Visit Wales press trips, which they would have been able to help with. A clear point of contact for local stakeholders is required within Visit Wales.
- Visit Wales has insufficient resources.
- Visit Wales should invest further in providing a specifically Welsh welcome at Holyhead port and Liverpool and Manchester airports.
- Local tourism stakeholders do not have a direct relationship with Visit Britain.
- Visit Britain needs to do more to sell distinctive aspects of Wales. Selling Britain in a general sense usually means selling England.

Other Welsh Government support

- Cadw do not seem engaged in tourism in the area, and have withdrawn from a number of local partnerships.
- There does not seem to be sufficient communication within the Welsh Government regarding tourism. This makes, for example, erecting signs to promote tourism businesses difficult.
- Communication between the Welsh Government and local stakeholders should be improved.
- Go Wales and Jobs Growth Wales are both excellent.

Welsh Government growth aims

- Given the rate of growth experienced by tourism businesses last year (approximately 3-4 per cent), ten per cent growth in tourism earnings by 2020 seems achievable, but unambitious.

Other points

- There is not enough tourist accommodation of high enough quality.
- Local authorities seem to appreciate the value of tourism in their area, but are still working out what their role is in supporting it.
- Local authority Destination Management Plans sound overly bureaucratic, and consequently local businesses do not tend to engage with them.
- The outdoor activity sector – and tourism businesses more broadly – help to retain talented young people in the area, and attract further talented people.

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Purpose

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The event was split into three groups, each consisting of local tourism businesses and Assembly Members. Group 2 consisted of the following people:

Attendees:
Rhun ap Iorwerth AM (Chair)
Keith Davies AM
Rachel Evans (Countryside Alliance)
Meurig Jones (Portmeirion)
Ceri Thomas (Cadw)

Barriers to Growth

- Although stakeholders felt that Visit Wales was doing a good job, the scale of Government spending on tourism elsewhere in the UK makes it difficult for Wales to compete. Glasgow alone has the same marketing clout as the whole of Wales. The shortfall in funding for marketing was especially significant because the challenge for Wales is to get tourists to visit for the first time; experience shows that they tend to return thereafter.
- A lack of joined-up working between local authorities was sometimes a problem. An example from south Wales was Penderyn whisky, which is situated in Rhondda Cynon Taff but is just a few miles from Merthyr; it cannot get a sign there because it is in a different local authority area.

- On the subject of signage, it was mentioned that New Zealand allows tourism-related retailers to have road signs, which works well. We could also do more to signpost play areas for children, which are important for families on holiday.

Infrastructure

- Transport was another barrier to growth, particularly in this region. For example, it was difficult to persuade tourists in Llandudno to make the journey across to Portmeirion because the roads were seen as inadequate.
- Not enough was being done on the A55 to promote the tourist industry. The road carries huge numbers of people travelling to and from Ireland and there is an opportunity to interest them in Wales. A tourist map of the A55 would be useful, showing the various attractions along its route.
- WiFi and mobile phone network coverage continue to be problematic for tourism businesses. Customers now take connectivity for granted, but some of the areas of Wales that are strongest for tourism are weakest for broadband and mobile signals.
- Rail connections to London were a strength for north Wales, with a good service from Euston. It would be useful to introduce something like the Oyster card, though, so that visitors to Wales could use a single ticket to travel in different areas and on different modes of transport.

Marketing Wales

- It was felt that Wales's history could be used more prominently in promoting tourism. Normandy, for example, was very effective in tying tourism to the historic WW2 sites along its coast. This was another way in which Wales might attract visitors, with many of our tourist destinations being rich in historical interest.
- Welsh literature could also be used to promote tourism.
- Food was another attraction we could make more of, with agri-tourism being hugely successful in places like Italy.
- Some recent advertising campaigns had tried to show that there was more in Wales than people realised. It was suggested that it might be better to focus on our known strengths.
- There was a general need for more advertising, especially in the north.
- We could do more to market Wales abroad and attract overseas visitors.
- The attraction of activities for tourists visiting Wales was often underestimated; for example, angling-based tourism was worth £150 million to the economy, and shooting was worth £75 million, but these were not featured in our advertising campaigns. We should look at ways of packaging

these kinds of activities into a programme that would keep tourists in Wales for a week or more.

- There was praise for the Ten Top Attractions advertising campaign in North Wales, which had been successful in promoting the region – even if there were now 14 attractions in the top 10! However, this kind of campaign needed to be picked up by the likes of Visit Britain and promoted at a UK level.
- One suggestion was that the Visit Wales website should be themed, so that people can find destinations and activities grouped together appropriately.
- The panel were concerned at the loss of the regional tourism partnerships, and keen to know more about how they would be replaced.

Major Events

- Wales has hosted many major events in recent years. How much of a boost do such events give to tourism? It was felt that the Ryder Cup generated interest in Wales during the build-up to the event, but not thereafter. The Welsh Open golf tournament, for example—which was hosted on the Ryder Cup course at Celtic Manor—has been discontinued just four years later. The fact that we hosted the Ryder Cup rarely features in our advertising these days.

Business Support

- This was seen as one of the most valuable ways the Government could support the tourism industry. For example, Portmeirion had been looking at ways of better informing visitors about the history of the site, and would benefit from a visitor centre at the entrance where tourists could learn the basics. Government could help to add value to tourism businesses by supporting that kind of project, and by streamlining the planning process where appropriate.
- Similarly, the Government might be the right kind of agency to help produce and promote maps of the Ten Top Attractions.
- Small businesses often have particular difficulty in accessing support from the Government or EU, and this was something that might usefully be looked at.

Enterprise and Business Committee

Inquiry into Tourism

Engagement event with stakeholders
Llechwedd Slate Caverns, Blaenau Ffestiniog – Thursday 18 September 2014

Purpose

The aim of this event was for Members of the Enterprise and Business Committee to hear the views and experiences of local tourism businesses.

The event was split into three groups, each consisting of local tourism businesses and Assembly Members. Group 3 consisted of the following people:

William Graham AM (Chair)
Mick Antoniw AM
Liam Barrie, Marram Grass Café
Sean Taylor, Zipworld
Jonathan Williams-Ellis, Glasfryn Park

Summary of the main points made

Restructuring of regional support

- Generally, the restructuring was welcomed as it was felt that previously there had been a lot of duplication in the work of the various agencies and they were all competing for the same pot of money.
- The Tourism Advisory Board needs more input from people operating at a grass roots level, especially those who can combine knowledge and experience of the industry with a good understanding of local issues.

Visit Wales support

- Visit Wales is not good at interacting with local businesses and therefore the appointment of Jane Richardson was welcomed.
- Where Visit Wales do consult with the industry, they do not appear to take those views on board.
- Greater clarity is needed in how to access advice from Visit Wales.
- Visit Wales advertising over the last four-five years has been poor.

Infrastructure

- A Welsh presence needs to be developed at Liverpool airport.
- Mobile phone and broadband coverage must be improved.

Barriers

- There is a lack of accountability in the planning authorities and no consistency in the interpretation of planning guidance.
- The planning process is too time consuming and bureaucratic.
- Local authorities are too risk adverse when making decisions in relation to planning.
- A senior member of the tourism department should be involved in approving planning applications.
- There is a perception among non-Welsh speakers that they are treated less favourably when dealing with some local authority departments than Welsh speakers.

Recruitment, Education and Training

- It is difficult to attract young people into a career in tourism as it is seen as offering only seasonal employment with limited pay and career prospects.
- More degree standard courses are needed which link up with businesses and provide opportunities for mentoring and work placements.

Other points

- There is a need to extend the season.
- Funding should only be provided for festivals held out of the summer season and should be limited to a period of two years.
- There are not enough high quality restaurants and there is insufficient high quality tourist accommodation.

- The northern European market is huge but is being neglected by the tourist industry. We need to identify the holiday patterns of these neighbouring countries to ascertain whether we can bolster the shoulder season.
- There are people on the ground who want to be listened to and who can advise.
- Northern Ireland and the Republic of Ireland work well together on tourism marketing. North Wales would benefit from a similar partnership with Liverpool because of its high-profile associations, such as the Beatles

Edwina Hart MBE CStJ AC / AM
Gweinidog yr Economi, Gwyddoniaeth a Thrafnidiaeth
Minister for Economy, Science and Transport

Llywodraeth Cymru
Welsh Government

Eich cyf/Your ref
Ein cyf/Our ref
William Graham AM
Chair
Enterprise & Business Committee

1 October 2014

Dear William

I am writing to update the Committee regarding issues raised with me about the North South rail journey time/capacity improvements project and Arriva Trains Wales' proposed December 2014 timetable.

Last year I asked my officials to review the North South rail journey times project. I agreed to proceed with the Network Rail recommendation that the scope could be reduced to 5.5 miles of redoubling, reducing estimated costs, and still achieve the outputs as specified at the project's inception. These are journey time reductions for services between Holyhead and Cardiff and additional capacity which could enable an additional train every 2 hours between those points. Some of these could run limited stop and therefore benefit from even further reductions in journey times than those for current services. These additional services are not currently committed, and I await the report of the north Wales Task Force before considering the right shape for the pattern of future services for north Wales.

I should like to set out clearly that the current redoubling project has never been considered in the context of capacity for additional journeys between points other than Holyhead and Cardiff. I recognise the fact that the UK Government is now committed to the future redoubling of Halton Curve and that this will open up new journey opportunities for North Wales. I am sure that the Task Force will include this in its considerations. Again, once I have the Task Force recommendations I shall consider future services.

Network Rail has recently indicated to officials that due to some technical challenges there are now cost and time pressures facing the project. I

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understand that these relate to the need to improve Broad Oak level crossing and the resulting additional pressures on Network Rail's signalling resources. I am extremely disappointed at Network Rail's management of this project. I have asked my officials to work with Network Rail to resolve these issues as quickly and effectively as possible.

Concerns have also been expressed with regards to Arriva Trains Wales' (ATW) proposed timetable changes for December 2014. This is the largest timetable change for North Wales since 2008 and, as might be expected, it has generated significant feedback from stakeholders both positive and negative. For example, my officials recently met representatives of Railfuture Cymru to discuss rail issues, and they highlighted a number of benefits for North Wales from the proposals.

The proposed timetable does provide significant benefits to North Wales including: additional capacity on some of its busiest trains including those serving Manchester, Birmingham and the Holyhead ferry terminal; the extension of some services to Manchester Airport (subject to Network Rail approval); and, some new cross-border services.

My officials will continue to work with ATW on the timetable taking into full consideration of all points raised to ensure these benefits are maximised. I am aware that some revisions have already been made to the timetable as a result of the feedback raised to date.

I shall continue to update Members.